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THE LIVERPOOL

MEDICAL AND SURGICAL REPORTS.

1868.

THE

LIVERPOOL

MEDICAL & SURGICAL REPORTS.

OCTOBER, MDCCCLXVIII.

EDITED BY

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PHYSICIAN TO THE NORTHERN HOSPITAL,

AND

REGINALD HARRISON, F.R.C.S.,

ASSISTANT SURGEON TO THE ROYAL INFIRMARY.

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PREFACE.

In presenting the Second Volume, we avail ourselves of the opportunity that is afforded us of expressing our gratification at the very great success which has attended the publication of the First Volume of these Reports. We could on that occasion only hopefully speculate on a future; but now, with a past so encouraging, we shall be further stimulated to make our Annual Volume what we wish it to be, viz., a storehouse for gathering in and elaborating the scientific material that everywhere abounds in our densely populated town and neighbourhood.

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October 1st, 1868.

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LIVERPOOL

MEDICAL AND SURGICAL REPORTS.

ON ULCER OF THE STOMACH,

By THOMAS INMAN, M.D. Lond.,

PHYSICIAN TO THE ROYAL INFIRMARY.

Amongst the women who present themselves for admission into the wards of our Infirmary, a large proportion suffer from ulcer of the stomach. Amongst the male applicants very few indeed have this affection. Judging roughly, the proportions are ten of the first to one of the last. The individuals are for the most part young, their ages varying from about twenty to thirty-five. In appearance they are often healthy; and the doctor sees with surprise that good-looking women can be suffering sufficiently to seek for a bed within the walls of a hospital. Yet though the real affection which underlies all their other complaints exists in the stomach, this organ is rarely referred to, and the patients seem to be wholly unconscious of there being anything amiss with it. Sometimes the prominent symptom is jaundice, sometimes debility, and sometimes excessive palpitation. By far the most common, however, is myalgia; there is, for example, excessive pain in the neck, between the shoulders, in the left or on the right side, in the abdomen, in the loins, or round the flanks, and sometimes in the buttocks and the lower extremities.

Now the existence of myalgia leads to the conclusion that the sufferer therefrom must be overworked, or underfed, or be constitutionally delicate. If, then, the labour which a patient has

undergone is not greater than usual, if she was accustomed to go through it for a long period without pain, and if her family history is good, it is clear that there is some temporary cause in operation, which produces weakness in the muscular tissues. By a few questions being answered in the negative, the physician ascertains that the seat of the disorder lies in the stomach, and that the patient eats very little in consequence of the pain produced thereby.

In some of the rarer forms of the affection the prominent symptom is chlorosis; and I have sometimes been led to doubt the reality of this last named disorder as an independent disease. The most prominent case which I have met with, illustrative of this doubt, occurred about twenty-two years ago, in the practice of a distinguished physician of this town. The patient, a young woman, for whom the same gentleman had successfully prescribed before, applied for admission into the Infirmary, and was admitted as a typical case of chlorosis. There was not a single symptom which is considered as pathognomonic of the disease in question which was absent; nor was there anything whatever which directed the attention of her medical advisers to the stomach or to the liver. The complaint seemed to be purely a blood disease. After being under observation for a few days, the patient died suddenly, and great interest was felt in the *post mortem* examination; deaths from chlorosis being very rare. On looking upon the intestines *in situ*, something unusual was seen in the part where the liver adjoins the stomach, and after a careful investigation it was found that there was a large ulcer in the latter organ. This was evidently an old one, and was what the surgeons would call callous. It had a superficial area of about five inches, and its depth from the surface of the stomach was about the third of an inch — in its progress it had caused adhesive inflammation between the stomach and liver, and had eaten its way entirely through the gastric tissues and into the hepatic structure — the bottom of the ulcer being formed by the substance of the liver. The other parts of the body were healthy, but pale.

This case is remarkable in every way. It demonstrates that an ulcer in a very small portion of the mucous membrane of the

stomach may, as it were, so influence the rest as to make it useless for the production of healthy chyme — or in some unknown manner to interfere with the general nutrition. Yet with this affection there was no emaciation of the body; the food taken had evidently been digested. The case still farther tells us that the integrity of the liver may be seriously impaired, and yet no jaundice, or other symptom of hepatic lesion, be observed.

The particular symptom last mentioned has its interest increased by the following case, which came under my own care. I admitted a young woman into the Infirmary, as a case of jaundice; and being unable to find any assignable cause therefor, I merely treated her with aromatic spirit of ammonia. After a while the patient left of her own accord, nearly well. Very shortly afterwards, however, she returned, almost in a dying state from gastric bleeding. The amount of blood passed by vomiting, and from the lower bowel, was enormous; and the woman lay for some days on the brink of the grave. By the judicious management, however, of the junior house-surgeon, Dr. Rawdon, and the unremitting care of the nurse, she survived; was treated as for ulcer of the stomach, and went out perfectly cured. In this instance it is probable — though it cannot be demonstrated — that the jaundice was indicative of the state of things which eventuated in the ulcer.

Of the cause of the disease of which we speak I have nothing new to say. Pathologically the complaint consists of the presence of one or more ulcers in the mucous membrane, of sizes varying from that of three fingers to a pin's head. On one occasion I saw at a Pathological Society a stomach taken from a man who had died from gastric hemorrhage, and all the members examined it closely to discover the source of the bleeding, without success; the ulcer was so minute that it escaped attention. Yet, by the merest accident, I found it the next day, when in the act of stretching the organ on the tip of my finger, preparatory to making a section for the microscope. The ulcer, which did not admit a probe, was examined with a bristle, and was found to have eaten its way into the coronary artery, and thus produced death. In some instances a stomach is found to contain ulcers in an active condition, and the cicatrices of others; some shew the scars alone; thus demon-

strating that the disease may be entirely cured. As a general rule there appears no tendency to a spontaneous restoration to the normal state without appropriate management.

Whenever an ulcer exists in the stomach there is a constant danger to life. The danger arises from an extension of the disease in depth—the perforation of the peritoneal coat before the membrane has been glued to the bowel or other organ. When the stomach thus gives way, its contents escaping produce general peritonitis, and death usually within a few hours. In these cases the suddenness and severity of the symptoms give rise to the idea of poison having been taken. A thorough understanding of the nature of this perforation is essential to a full comprehension of the principle upon which our treatment is to be conducted.

When the stomach is sound it produces gastric juice of normal quality. This is secreted in quantity to effect digestion, and in quality according to the nature of the food. That which is formed to dissolve meat is stronger than that secreted to digest milk. The gastric juice is not formed when the stomach is empty. When once formed to digest meat, meat is dissolved. Now the stomach itself is meat, and not the less so because uncooked. Experience has told us that the organ in question is sometimes itself digested, *i. e.* if death has been sudden, and just after a full meal of animal food. The reason why the stomach does not always so act upon itself is, that its membrane constantly interposes a dense layer of mucus between the digesting mass and itself, and is thus protected. But when a portion of this mucous membrane has, by disease, been removed, there can be no protection formed to intervene between the gastric juice and the base and sides of the ulcer; consequently, at every meal which the victim takes, the process of self-digestion begins in the unfortunate stomach. As in the web of Penelope no real progress appears, for the activity of reparation is counterbalanced by the activity of the daily process of destruction. This process the physician may readily recognise with an intelligent mental eye. But he can make no physical observations, and is obliged to content himself with reading the symptoms. Yet ere we record these, let us notice that the ulcer may give way by being stretched beyond a certain point; the same cause will prevent its

healing; just as a puncture in a limb largely distended by dropsy will often refuse to close up. The ulcer may also give way in consequence of external pressure or injury transmitted through the abdominal walls.

The symptoms of the disease in question are readily recognised. They may be summed up thus:—there is habitual indigestion, a pain increased by all food, and persisting during the whole time the stomach is full. This pain is severe in direct proportion to the food taken; meat, and such fluids as wine and spirits, aggravate it to its highest pitch. There is also much suffering when the stomach is distended by flatus. Habitual painful dyspepsia, aggravated by a meat diet, is almost pathognomonic of ulcer of the stomach. Such accidents as water-brash, jaundice, hæmatemesis, melæna, vomiting, and gastralgia occasionally happen, but they form an unimportant item in the diagnosis.

We are now in a position to consider the treatment; and that I may explain myself clearly, I will refer my readers in the first place to the mouth and to the womb. Let him recall to himself the time when he had a fissure in the lips. He will then remember that any thing which made him open his mouth was so productive of pain that he was glad to keep his lips closed; the distension of them prevented the repose necessary to the healing process.

Again, he finds a patient flooding after delivery. His mental vision sees the huge surface from which the placenta has come, bleeding at every pore, and he knows that he must, if possible, diminish the area of that teeming wound. To effect this he endeavours to make the womb contract, for he knows that the superficies of the bleeding part will be reduced most effectually by diminishing the whole uterine surface. This may be seen, in reality, by first making a hole in a piece of strongly stretched india-rubber, and then allowing the caoutchouc to contract. It will then be noticed that what seemed an area as large as a shilling becomes less than the size of a groat.

Hence we deduce that the first treatment for ulcer in the stomach is to keep the organ as small as possible. The quantity

of food given at any one time must be very limited, *i.e.*, about three ounces should be the maximum.

Again, we must reduce the power of the gastric juice to dissolve the stomach to a minimum; and this can only be effected by a total abstinence from all solid animal diet.

Practically we carry these indications out by restricting our patients to a teacupful of bread and milk every three hours.

But the reader will at once recognise the fact that this amount of nourishment scarcely suffices to prevent debility — that this result must happen we foresee, and it is guarded against by diminishing the necessity for food to a minimum — all exercise and exertion are forbidden, and the patient is confined to bed. This is the routine practice followed in my wards, and I see no reason to alter it. After many years of close observation, I am convinced that all medicines, including alcoholic stimulants, are prejudicial; white bismuth is the sole exception; but the cases in which it has seemed to do good do not amount to one in twenty. All aperients do harm, and mercurials are especially baneful—I have never once ordered them, but my patients have taken them in spite of me, and invariably with a bad result. If the bowels require relief, "enemata" are the proper remedies.

Now I have always held that an intelligent Physician ought to be able to form a tolerably definite notion of the course of the case under his management; and this is certainly advisable when he prescribes a diet almost too small to support life, and wholly inadequate to support its active duties. To attain to precision, he must ask himself how long he expects that an ulcer elsewhere, under the most favourable circumstances, will require ere it is wholly and soundly healed. His mind then reverts to the period when he attended "hospital practice," or he became otherwise acquainted with ulcers of the leg; and from various other sources he concludes that six weeks is an ample time for complete cicatrisation, four of which are passed in the process of granulation and the formation of new skin, and two in the development of the cuticular structure. Consequently, he tells his patients who have ulcer of the stomach, that a strict, a very strict, attention to his

regulations is necessary, for at least a month, after which they will be modified. When such specific statements are made, the plan referred to above is generally followed, cheerfully, by the sufferer, whose courage is sustained by the knowledge that her trials have an end. During the first week, little change can be noticed; even myalgia, when severe, requires a longer rest ere it begins to abate its pains. After the first fortnight, the improvement in the general symptoms is very apparent, and the patient's spirits rise to such an extent as to make the confinement of bed irksome. In all such cases, I judge it to be the best plan to explain, in easy terms, the reasons for my proceeding, and have never yet found the sufferer recusant. We count the days together, like boys whose holidays approach; and when the month expires, the diet is enlarged by the yolk of an egg, egg-pudding, or bread and butter, &c.—just about one good mouthful; then, if all goes well to-day, to-morrow sees the supply doubled, and an hour out of bed is added as a reward; then, and hitherto without an exception, the eatables are gradually increased, until the patient takes the ordinary Infirmary diet, and can sit up, walk about, and otherwise act as any other woman.

I have now seen so much of this complaint at our hospital that I am almost enamoured of it, yet in private practice there are few diseases which the doctor is called upon to treat that I dislike to meet with more. Long experience has convinced me of the paramount importance of every detail of the plan which we follow out at the Infirmary, and these details can rarely be carried out in ordinary life. Ere now I have felt savage at a woman, who, week after week, has determined to take a slice of beef or mutton at the end of seven days, and who has thus undone in a few minutes the work of many hours. Another patient has taken a blue pill for "biliousness;" another has wearied herself with exercise; another has indulged in wine; another, with porter, because "she felt so very weak." Few can or will stay in bed. Yet each one expects "the doctor" to repair the mischief which they have done. Well, perhaps after all we must not grumble at this, for it is headstrong patients such as these which I describe that help to make the fortune of the physician. What is one

man's poison is another man's meat; and if people will persist in keeping themselves ill, when their advisers are doing their best to make them well, it is but justice that the former shall pay the due penalty, both in purse and person.

ON THE USE OF THE BROMIDE OF POTASSIUM IN THE TREATMENT OF SOME NERVOUS AFFECTIONS,*

WITH CASES.

By JAMES TURNBULL, M.D.,

PHYSICIAN TO THE LIVERPOOL ROYAL INFIRMARY.

Therapeutical inquiry is a branch of practical medicine which has long been comparatively neglected; but it is now attracting increasing and well-merited attention. I have elsewhere made the observation that scientific medical inquirers had given less of their attention to the action and uses of medicines than to some other subjects, such as pathology, which, however indispensable as a basis for further research, often discloses to us the results of disease without throwing any light on the all-important question of treatment. I was glad to observe that Sir Thomas Watson, in his address at the opening of the Clinical Society, pointed out forcibly the great practical importance of this subject, and commended therapeutical inquiry to the study of the members of this new Society. We have other evidence of the increasing attention paid to this subject in the Gulstonian Lectures at the College of Physicians having been given this year by Dr. Harley, on the physiological actions and therapeutical uses of certain drugs in common use, in the formation of a therapeutical committee of the Harveian Society, and in the publication of a new monthly journal of therapeutics. I would, however, point more particularly to the recent researches by Dr. A. Crum Brown and Dr. Thos. R. Fraser,

* Paper read to the Liverpool Medical Society.

on the connection between chemical constitution and physiological action, as affording evidence, not only of increasing interest, but also as furnishing new facts of a definite and important character, deduced from experimental inquiry, aided by organic chemistry. They have proved that, by altering the constitution of several of the vegetable alkaloids, so that they are changed from nitrile to ammonium bases, their actions are so completely changed that we might say they are reversed. The subject is one which formerly engaged my attention; and, in a paper entitled "Researches on the Physiological and Medicinal Properties of some of the compounds of the Organic Radicles, Methyl, Ethyl and Amyl," I made the following observations on the probable difference in the effects of the alkaloids, according as they belonged to one or other of the series of bases. "We have no knowledge whatever of any relation that may exist between their chemical constitution and the different actions they exert on the animal economy. It is very probable, however, that an examination of the properties of the artificial alkaloids would throw light on this subject; for the progress of organic chemistry has shown that many of them have a definite composition and relation to each other, and they have accordingly been arranged in four series, viz., the amide, the imide, the nitrile and the ammonium bases. It would be interesting to know what are the properties of each of the artificial alkaloids (and I may remark that Dr. Simpson* has found that one of them, furfurine, has antiperiodic properties like quinine); but it would be still more interesting to know if certain properties are common to all the members of a series, and in what respect the bases belonging to one series differ from those of another. In this way we might expect to trace a relation between the composition and the effects of remedial agents, as well as to acquire new and valuable remedies."

The experimental researches of Dr. A. Crum Brown and Dr. Thos. R. Fraser have now actually proved what was here anticipated in 1854, and have demonstrated that certain properties are common to members of a series; for, by converting strychnia,

* Now Sir James.

brucia, thebaia, codeia, morphia, and nicotia, which are nitrile bases, into ammonium bases, by the addition of iodide of methyl, they not only reduced the poisonous properties of these alkaloids, rendering them comparatively innocuous, but they entirely changed their action on the nervous system; so that, whereas several of the nitrile bases, more particularly strychnia, cause violent spasmodic muscular contraction, the ammonium bases, — for example, the iodide of methyl strychnium, — paralyse the spinal motor nerves, and cause muscular relaxation. "We may conclude," they observe, "from these facts, that, when a nitrile base possesses a strychnia-like action, the salts of the corresponding ammonium bases have an action identical with that of curare."

This is not only a most important discovery, but it shows what great results in the elucidation of the *modus operandi* of medicinal agents may be expected from well directed inquiries, aided by the light which the present advanced state of organic chemistry can throw on the subject.

With these preliminary remarks, I proceed to give some illustrations of the therapeutical use of the bromide of potassium, which is now a remedy of acknowledged value in many nervous disorders. Bromide of potassium was first recommended as a remedy for enlargement of the spleen, by Dr. Thomas Williams; but it is somewhat strange that its sedative action on the nervous system was not found out till a comparatively recent period. Dr. Garrod tells us that the bromide of potassium was introduced into the Pharmacopœia of 1835, but that it was removed in 1851, no clinical evidence having been afforded in the interim of its possessing any powers which entitled it to be placed in the Materia Medica. It was afterwards, however, re-introduced; and in the last British Pharmacopœia we have likewise bromide of ammonium, which was brought into notice by Dr. Gibb, and is now used by many medical men as a remedy in hooping cough.

The most important of the effects produced by bromide of potassium are the following. 1. The alterative or absorbent action it sometimes exerts, which has been adverted to as the first discovered of its medicinal properties. 2. Its power of diminishing

sensation, and causing dryness of the throat and neighbouring parts, an effect which Dr. Gibb found to be more decidedly induced by bromide of ammonium, and led him to try it as a remedy in hooping cough. This power, which may be partly due to the local action of the bromides, but is no doubt chiefly owing to the sedative effect produced on the nervous centres through absorption, has likewise been turned to account in the treatment of spasmodic asthma. 3. In large doses, bromide of potassium produces sleepiness; and this is one of its effects to which I would more particularly direct attention, as it furnishes a valuable means for the treatment of some nervous affections. 4. It has a sedative influence on the sexual organs. 5. It has been found a valuable remedy in epilepsy. 6. In medium doses, continued for long periods, it produces the remarkable sedative effects which have been described by Dr. Bazire, the translator of Trousseau's Lectures, and of which an exceedingly well marked case has come under my observation.

The therapeutical use of the bromide of potassium, which I wish more particularly to notice, is the power which it has of producing sleep when administered in full doses. There is no medical man in extensive practice who has not in various cases experienced much difficulty in overcoming the troublesome symptom of sleeplessness, and felt the want of an efficient remedy in cases where opium could not be used. Though opium is one of the most valuable remedies in the Materia Medica, we all know from experience that it often causes increased restlessness instead of sleep, and produces various consequences, such as constipation, headache, &c., which render it altogether inadmissible with some patients. Though morphia is less liable to produce such unpleasant consequences, it is not free from these objections; and the various other derivatives from opium which have from time to time been brought into notice, such as the sedative solution of opium, chlorodyne, nepenthe, &c., are none of them entirely free from the objectionable effects of the parent drug.

When sleep is prevented by pain, arising from some abnormal physical condition of the body, opium in some of its various forms is the grand remedy; and, if we except chloroform, it has no rival

as a sleep-inducing agent in this class of cases; but there are others where the want of sleep arises from mental rather than from physical pain, or from trifling causes exciting a morbidly sensitive nervous system. In the latter, opium often prevents, instead of inducing sleep, and causes its after effects in an aggravated degree. I have tested the bromide of potassium in some cases of the latter description, and being convinced that it is a remedy of power, and one the value of which is scarcely yet generally known by medical men, I shall briefly give some details of a few cases of this description in which I have used it with advantage.

Brown Sequard was, I believe, the first to point out the value of the bromide of potassium in inducing sleep, and to show the mode of giving it, and the kind of cases in which it is most likely to prove of service. In one of his lectures on the recent advances of our knowledge in the diagnosis and treatment of functional nervous affections, he says, "It is of the utmost importance to improve the sleep, which is generally bad in persons attacked with a morbid increase of the reflex excitability. For this purpose an invaluable remedy has recently been discovered; it is the bromide of potassium. Excepting when pain is one of the causes preventing sleep (in which case opium, aconite, and belladonna should be employed together), I have found that this remedy has a wonderful power to produce quiet and refreshing sleep, without any drawback that I am aware of. I usually give to adults a dose of thirty grains of that salt a quarter of an hour before the last meal, and a second dose of from thirty to fifty at bedtime. In cases in which, without any nervous complaint, there is sleeplessness, owing to some cause of cerebral excitement, as well as in all neuroses, excepting hydrophobia, tetanus, very severe cases of delirium tremens, and some forms of insanity, sleep is almost always induced by that remedy."

Dr. Behrend has published in the *Lancet* some cases in which he gave the remedy with great advantage. It was, however, from reading Brown Sequard's lecture that I was first induced to make trial of it, and I shall now refer to some of the cases in which I have given it.

Case 1.—In the early part of 1866, I had under my care a gentleman, about 67 years of age, of peculiar nervous temperament, but a man of great ability, who had occupied various important positions. I had often before attended him on account of dyspeptic disorders and nervous depression. Many years before, I had attended him when he had great irritation of the bladder, caused by an excessive quantity of the cubic crystals of oxalate of lime, on account of which he also consulted Dr. Prout. From this, however, he completely recovered, under treatment, first by Vichy water, and afterwards nitro-muriatic acid; and at the time referred to there were no oxalate of lime crystals in the urine. There were domestic circumstances disquieting him, and also the commercial panic, which somewhat affected him; and he had his usual dyspeptic symptoms — uneasy sensations in the stomach, bowels, and rectum, with flatulence, and also great nervous depression and sleeplessness. At this time, however, the symptoms were manageable, and I gave him the bromide with good effect, and left off attendance, as he got much better. In the month of April he had a return of nervous depression, brought on by the unexpected death of one of his most intimate friends; and he was for a time under the care of a neighbouring medical man, with whom I was soon after associated in the treatment of the case. He gradually got much worse, becoming so emaciated that suspicion of organic disease of the stomach or bowels was entertained, though there was no tumour or other positive evidence, but he had latterly the intermittent delirium which we not unfrequently observe in cases of malignant disease of the stomach; and the depression, uneasy painful sensations in the abdomen, and want of sleep were most difficult to overcome. In the latter stage, the bromide having failed to relieve, a combination of codeia and morphia in full doses was found most beneficial. I have referred to this case, as it was one that rendered it necessary to exercise all one's ingenuity to find available means to procure sleep, and, in the advanced stage, to relieve the painful sensations; and also because it showed me that the bromide had a power which might be turned to good account in less severe cases.

There was no *post mortem* examination, so that there was no positive evidence of the suspected cancer.

Case 2.—I frequently attend a gentleman, about 68 years of age, of nervous temperament, who has for many years had slight facial paralysis, and who had about ten years ago, and subsequent to the facial attack, a very severe nervous attack, with some head symptoms. He suffers habitually from constipation, and at times from dyspepsia, with flatulent painful sensations at the stomach, which often deprive him of sleep for many successive nights. In this case I have found that nothing affords so much relief as the bromide of potassium, which he takes when troubled with these symptoms in half-drachm doses, one about seven o'clock in the evening, and again at bedtime, with the effect of inducing sleep without the least unpleasant consequence.

The three next are cases of delirium tremens, and in the first of them opium had been freely tried without success, but sleep was readily induced by the bromide, given in half-drachm doses every four hours until two drachms had been taken. The second was a very violent case, where the remedy was administered in the same way, until seven drachms had been taken, but, with each of the last half-drachm doses of the bromide, a pill with one grain of opium was likewise given. After that, sound sleep was induced; and the symptoms rapidly abated. The third was a milder incipient case, where the bromide alone in moderate quantity sufficed to calm the nervous excitement and induce sleep.

Case 3.—The patient was a gentleman about 34 years of age, of dissipated habits, who had several times suffered from delirium tremens. I saw him, in consultation with Mr. Byerley, who had given opium largely without effect. The symptoms were like those of typhoid delirium; there was profuse perspiration, and the pulse was very weak and rapid. He had picking of the bed-clothes, and was quite unable to understand or reply correctly to questions. We ordered half a drachm of the bromide of potassium to be taken every four hours till he slept. After the fourth dose, which was

taken about two o'clock in the morning, he fell asleep, and slept for five hours. He awoke quite conscious, and when I saw him about midday all the symptoms were better, and he soon got quite well.

Case 4.—I was summoned to see, in consultation, a gentleman about 38 years of age, who had on several occasions suffered from attacks of nervous excitement, his habits having been intemperate for several years. He had the usual symptoms — restlessness, tremor, profuse clammy perspirations, and no sleep for three nights. He was quite delirious, and saw imaginary objects, but talked rationally for a few seconds, and then wandered quite incoherently. The pulse was very weak (94), and the hands very unsteady. He had been freely purged, and I at once prescribed half-drachm doses of the bromide, with aromatic spirit of ammonia, every four hours, the alcoholic stimulant being limited to six glasses of sherry, which, however, he overstepped. The following day he was still incoherent, but less excited, and more manageable. As he had not slept, the bromide was continued, and he was ordered to have with each dose one grain of opium. The next morning he went to sleep at half-past six, and slept soundly for four hours. He awoke at intervals during the day to take food, but no further sedative was needed, as he became perfectly quiet and rational; and, having slept the third night, he was quite convalescent on the fourth day from my first visit.

Case 5.—A gentleman, 33 years of age, a wine and spirit merchant, of nervous temperament, and rather irritable digestive organs, came under my care, suffering from vomiting. He was tremulous, perspiring, and had the frightened look of one who was suffering from over stimulation, though from constant tasting, rather than habits of intemperance. He had no delirium, but had suffered from restless, sleepless nights, as well as the vomiting. Having purged him with podophillum and aloes, I gave him fifteen grains of the bromide of potassium, with aromatic spirit of ammonia, three times a day, and half a drachm of the bromide at bedtime. This treatment soothed the nervous excitement, and produced sleep, and in a few days he got quite well.

CASE 6.—In the first number of this Journal, I published the case of a woman, 26 years of age, who had hemiplegia, preceded by convulsions, and where sleeplessness was a prominent symptom. She was most urgent in asking for something to make her sleep, not having slept at all for many nights, and being greatly exhausted by want of rest. Fifteen grains of the bromide were ordered to be taken at six in the evening, and again at nine o'clock. She slept the first night, and after taking it in this way for a few days, there was no further need of the remedy. She also recovered completely from the paralysis of the side.

These cases will suffice to show any one that may not have used the bromide in full doses to overcome sleeplessness, that it is a valuable remedy, which may be safely administered for this purpose in a variety of nervous affections.

I shall not now offer any observations in regard to the sedative influence of bromide of potassium on the sexual organs, further than to adduce one case where sleeplessness was a prominent symptom, and was relieved by this remedy.

CASE 7.—The patient, a gentleman about 28 years of age, had brought himself by his vicious habits to a state of extreme weakness and emaciation, and the nervous depression was verging on melancholic insanity. In addition to tonic treatment with steel and cod liver oil, which he took during the day, I ordered bromide of potassium at bedtime, in half-drachm doses. Finding this dose, however, insufficient, I gave forty-five grains, which caused sleep, and produced a beneficial influence on all his nervous symptoms.

The power which bromide of potassium has in controlling or curing epilectic seizures is another subject which I shall not enter into further than to express my conviction of its power and value in the treatment of this disease. Dr. J. Russell Reynolds states that its therapeutic effects are seen with the greatest amount of certainty and clearness when it is given to those who are suffering from paroxysmal diseases, and that its action is most conspicuous in epilepsy. I would refer on this head to his paper, and also to what

Dr. Bazire, the translator of Trousseau's lectures, has written on the same subject.* The evidence in its favour is such as to encourage a trial of the bromide in all cases where the remedy has not already been perseveringly given in sufficient doses.

The bromide has been used with more or less benefit in many other nervous disorders, such as mania, hypochondriasis, chorea, vertigo, head-ache, and local affections. I gave it lately with very good effect to a young lady who had long suffered from hysterical difficulty in swallowing. Dr. Begbie states that he has prescribed it successfully in some cases of diabetes; and Dr. J. Russell Reynolds has given it with great advantage in certain nervous affections characterised by sudden, distressing, but indefinable feelings in the epigastrium and abdomen, which he attributes to disturbances of the vaso motor system. A case, which might be embraced in this group of anomalous nervous affections, and where there was disturbance of the circulation in the head, with uneasy sensations in the abdomen, was quickly removed by bromide of potassium, after other means had been resorted to ineffectually.

Case 8.—A gentleman, about 45 years of age, came under my care, who had formerly been stout and plethoric, at which time he suffered much from bleeding piles, but had for some years become less stout and had almost ceased to be troubled by the piles. He had distressing sensations at the epigastrium, loss of appetite, and flatulence, but he was most alarmed by some head symptoms, pain, giddiness, and floating specks before his eyes. There was no heat, increased action of the vessels, or any sign of determination of blood to the head, but, on the contrary, the pulse was very weak, and the countenance paler than natural. He took steel with ammonia, but, still suffering from the same symptoms, he went to Harrogate for ten days, and took the saline sulphur aperient water, which improved the condition of his digestive organs, but did not remove the uneasy sensations at the epigastrium, or in any degree diminish the head symptoms. On his return I prescribed 12 grains of the bromide, to be taken three times a-day, in a tonic infusion, with some

* "The Practitioner," July, 1868.

aromatic spirit of ammonia. This had an immediate effect, in relieving all his symptoms and improving his appetite also, and within four days he said that, whereas he had been quite unfit for any business, he felt fresh energy and was able to face anything.

I shall now advert to what has been called bromism, or the effects which may be produced by the excessive use of this salt when it is taken in full or considerable doses for long periods. The following case is a good illustration.

Case 9.—A lady, about 47 years of age, whom I had previously attended occasionally, came under my care in November, 1865, on account of pain at the stomach and vomiting. There was constipation and very dark coloured motions, which seemed to be coloured by blood, as they got blacker by purging. On examination of the epigastrium, a tumour, the size of a small egg, was found in the situation of the spleen. She was seen by Dr. Vose also, and we both thought it might prove of malignant nature. By blistering, however, attention to diet, and other means to relieve the dyspeptic symptoms, and finally by the use of cod liver oil, which improved the general health as it had often previously done, the tumour gradually decreased, so that towards the end of the year it could scarcely be discovered. In the spring she went to Edinburgh, and put herself under the care of one of the leading physicians there, who prescribed bromide of potassium, the dose of which was increased to about a scruple thrice a day. She was more or less under his care all the summer and autumn, and she was so strongly impressed with the belief of the necessity of its continuance for the removal of the tumour, or what remained of it, that she clung to it with great tenacity. She lost her father in the autumn, and at that time her health was so bad that it was thought she could not long survive. In November, 1866, she returned to Liverpool, but did not place herself under my care for a fortnight after, as she did not wish to have the treatment of her Edinburgh adviser interfered with. Her friends, however, found that she was getting extremely weak and ill, and I was therefore sent for. I found her very emaciated and weak, and of a peculiar pallid colour. She was also inclined to doze, so that she often dropped off to sleep. There was remarkable slowness of speech, and difficulty in collecting the ideas and

expressing them. The extremities were cold, and the pulse slow and very weak. She was fearfully depressed, and frequently shed tears. There was no tumour whatever to be felt, and therefore no indication for continuing the bromide. The symptoms were such as might have been partly due to malignant disease, but I thought they were chiefly caused by the protracted use of the bromide, and I insisted on it being relinquished. I improved the diet and gave stimulants and tonics, with cod liver oil; in fact, returned to the original treatment she had left off on going from Liverpool. The rapidity with which she recovered, getting colour, strength, flesh and spirits, was surprising, and showed me that her condition and symptoms were entirely due to the excessive and protracted use of the bromide. She has continued perfectly well.

I was not then aware that Dr. Bazire had described a condition precisely the same, which was induced by the protracted use of the bromide of potassium. "When given," he says, "in large doses, such as thirty and forty grains, two and three times a day, it produces very striking symptoms in about ten or fifteen days. The patient at first complains of a dull headache, becomes listless and apathetic, with an expressionless face and lustreless eye. His intellect is clouded, his mind confused, and he is unable to concentrate his thoughts. There is slowness of perception, and questions have to be asked several times before their meaning is understood and an answer can be obtained. If, when these symptoms have begun to show themselves, the medicine be continued, hebetude follows, with inability to think, and a kind of stupor resembling that of the first stage of typhoid fever, together with drowsiness, somnolence, and constant dropping off to sleep. In no case have I seen delirium or hallucinations. The pupils are dilated, and contract very sluggishly under the influence of a strong light; the sensibility of the conjunctiva is so deadened that a finger may be passed with impunity over the surface of the eye-ball without producing winking. Hearing loses its usual acuteness, and it is only by speaking in a very loud voice that the patient can be roused from his stupor."

These symptoms are similar to what I witnessed in the preceding case; and Dr. Bazire has described effects of a less severe

character, but with an eruption of boils, occurring when the bromide is taken for much longer periods, in ten to fifteen grain doses, twice or thrice daily.

The chief object of this Paper having been to give practical illustrations of some of the uses of bromide of potassium, I shall not enlarge on its *modus operandi*. It would seem, however, that it produces a direct sedative effect on the whole nervous system, especially the sensory and motary nerves, and that it has a power of controlling irregular vascular action. According to MM. Damourette and Pelvet, it acts as an anæsthetic on the nervous centres and cord on the one hand, and on the mucous and tegumentary surfaces on the other. It diminishes muscular irritability, and thus has an extensive effect on the muscular organs of digestion, respiration, and urinary secretion, as well as the striated muscles.

A remedy having so extended an influence through the nervous system must admit of a great variety of practical applications in the treatment of disease, and there is reason to believe that, as it becomes more generally known, it will be increasingly used as a medicinal agent.

CASES OF CHOREA,

WITH REMARKS,

By Dr. OXLEY,

PHYSICIAN TO THE LIVERPOOL INFIRMARY FOR CHILDREN.

Case 1.—Female, aged 7 years. Admitted Nov. 1st, 1864; discharged cured Jan. 26th, 1865. A fair, blue-eyed, anæmic child. A week ago she became very restless at night, and since then has gradually lost power over her limbs and speech. She is unable to stand alone, and cannot articulate. Tongue foul, bowels costive; pulse 110, weak and jerky.

Ordered a calomel and jalap purge, and five-grain doses of the ammonio-citrate of iron, in half an ounce of infusion of quassia, three times a day.

For some days this patient seemed to get much worse, and was with great difficulty fed, or prevented from injuring herself. Sleep seemed quite out of the question. A draught, containing ten drops of tincture of Indian hemp, was given every four hours. This was followed by marked improvement, and was discontinued at the end of a week. She was re-admitted in the following May, with a similar attack, treated much in the same way, and discharged cured in August.

Case 2.—Female, aged 9 years; admitted as an out-patient Dec. 24th, 1867; discharged cured April 23rd, 1868. A slightly built anæmic child. A week ago, while nursing her little brother, he took a fit, and died in her arms; this frightened the child very much, and soon after her mother noticed something strange in her manner and gait. She dragged the left leg after her, her arm hung by her side, and she was not able to use it as before. Has never had scarlet or rheumatic fever. No abnormal heart sounds. This case is one of only slight chorea, there being rather symp-

toms of paralysis than of chorea. She was treated with ten grains of bromide of potassium twice a day.

Case 3.—Female, aged 8 years; admitted Sep. 27th, 1867; discharged cured Oct. 10th. A pale, delicate looking child. A month ago it was noticed that, after starting up from a dream, in which she seemed to have been frightened, she had lost control over her right side, and looked like a silly person. Three months ago she had small pox very severely, and since then has not been at all strong. The chorea is confined to the right side, and is accompanied with more than the usual loss of power. She looks at one with a vacant, idiotic stare, and is constantly twisting and turning; the bowels are very constipated, and have been so for some time back; pulse weak and jerky; starts very much in her sleep; heart's action irregular, its impulse being greatly increased by any slight cause. Treatment: purgatives, and the ammonio-citrate of iron; a tepid salt water bath at bedtime.

Case 4.—Male, aged 10 years, sallow complexion, small for the age. Came under my notice Sep. 24th, 1866. Five months ago his feet swelled, and he made very little water. A week ago it was noticed that he twitched the left arm when standing still, and dragged the leg of this side after him. Had a fit when four years of age. Has the usual choreic symptoms in a very marked degree. The bowels are regular, the tongue clean; pulse 110, and very weak; the feet are œdematous: he rambles in his sleep. Has never had scarlet fever or rheumatism; has a trace of albumen in his urine, but no casts; the heart's action is feeble, but no bruit can at present be detected. Treatment: fifteen drops of the tincture of steel, three times a day. He was discharged cured Oct. 5th. He presented himself this morning (Feb. 20th, 1868), complaining of great pain in the region of the heart. I found increased impulse, and a loud systolic bruit over the base of the heart. Pulse 110, weak and thrilling.

Case 5.—Female, aged 12 years; admitted October 15th, 1865; discharged cured October 26th. Tall, and rather slightly

built; pale, and anæmic. It was noticed that, after being sent home from a situation in disgrace, she seemed dull and out of spirits, and that she had not full control over her voluntary movements. On admission, both sides of the body were choreic, the right side being the worse. States that she had not been well fed in her place, and was kept very hard at work. Tongue dirty, breath foul; pulse 90, weak. She seems stupid, and does not answer questions readily, although the mother states that previous to the attack she was a sharp and intelligent child.

Treatment: tepid douch every night; compound jalap powder, and the ammonio-citrate of iron in ten-grain doses.

Case 6.—Male, aged 12 years; admitted November 17th, 1863, discharged cured March 4th, 1864. A strumous looking lad. Has never had good health since he had measles, ten years ago. Both sides of the body are affected with chorea. Pulse 100, feeble; heart's action regular, with very little power. Treatment: tincture of iron, in ten-drop doses, three times a day, and a cold bath at bedtime.

Case 7.—Male, aged 9 years; admitted January 27th, 1865; discharged March 13th. Re-admitted October 8th, 1867; discharged November 11th. A pale, anæmic looking lad, tall for his age, and very slender. Has never had rheumatism or scarlet fever. On admission, all control over the voluntary muscles was lost; the whole body was constantly in motion. It was, indeed, one of the worst cases which has come under my notice; there was no cause given. Heart's action extremely rapid and tumultuous. He could take no solid food, and had to be fed for some weeks. The ammonio-citrate of iron was given in ten-grain doses; and afterwards, the tincture of iron, with quinine.

This boy was re-admitted in 1867, with chorea and mitral disease. He was discharged cured of the chorea, but with heart disease of a serious character.

Case 8.—Female, aged 10 years; admitted July 10th, 1865; discharged cured October 23rd. Has been getting thin for some

time back, and has hesitated in talking. When admitted, she could not stand, and was constantly and rapidly throwing the whole body into violent contortions; and it was found necessary to pad her bed. Food was with great difficulty swallowed, and she was nearly choked on several occasions. There was a history of a feverish attack, with a rash; no medical man saw her, and she soon recovered. Pulse 100, jerky and weak. One child in the family had died suddenly in a convulsion; the others were all strong and healthy. Treatment: Tincture of steel, and infusion of quassia, and a tepid bath at night.

Case 9.—Female, aged 9 years; admitted January 27th, 1868; discharged March 23rd. The right side only was affected. The illness, which began some months before admission, was supposed to have been caused by the weak state in which an attack of scarlet fever had left her. The heart's action was regular. The choreic movements were not violent when lying down, and only became so when any attempt was made to use the muscles of the afflicted side. Treatment: tincture of steel, in five-drop doses; February 7th, syrup of strychnine, three times a day, the $\frac{1}{3}\frac{1}{2}$ part of a grain gradually increased to $\frac{1}{1}\frac{1}{2}$; this was continued to March 9th, when, there being no improvement, citrate of iron and quinine was ordered; this was soon followed by amendment, and the patient left the hospital quite well in a few weeks.

Case 10.—Female, aged 13 years; admitted November 24th, 1864; discharged cured January 26th, 1865. The left side was affected, the heart was free from disease. The cause given was fright. Treated with iron and tepid douch. Had a previous attack four years ago.

Case 11.—Female, aged 10 years; admitted February 25th, 1865; discharged cured May 15th. A pale, anæmic child, with no power over her voluntary movements. Was frightened by some boys, and came home with choreic movements of the mouth. This was thought to be a bad habit, and she was punished. When, however, the other parts of the body became affected, she was

brought to the hospital. Is not able to stand or speak; has a quick, irregular pulse; tongue dirty; bowels have not been opened for some days. Has never had any illness since an infant, but has always been nervous.

Treatment: tincture of steel in ten-drop doses, with a tepid douch at night.

She was re-admitted November 2nd, 1866, and discharged on January 24th, 1867.

Case 12.—Male, aged 6 years; admitted March 18th, 1867; discharged April 22nd. Cause: fright. Previous disease: scarlet fever, four years ago. Treatment: tincture of iron.

Case 13.—Male, aged 10 years; admitted December 3rd, 1866; discharged February 18th, 1867. No cause given. No cardiac disease. Both sides of the body implicated. Unable to stand alone. Has previously been a very healthy child. One of his sisters had chorea at the same age. Treatment: tincture of iron, in ten-minim doses.

Case 14.—Male, aged 10 years; admitted July 15th, 1867; discharged August 26th. Pale, and badly nourished; has had very little food for some time back; has been severely beaten by his father for stupidity. The chorea came on gradually, the legs being first attacked. When admitted into the hospital, the choreic movements were so violent that he was kept from injuring himself with considerable difficulty. He had quite lost power over his speech, and had to be fed. Treatment: tincture of iron, with a tepid douch at night.

Case 15.—Female, aged 11 years; admitted August 29th, 1867; discharged November 11th. No cause given. The chorea came on very gradually, the muscles of the face being implicated in the first instance. On admission, the whole of the muscles on both sides of the body are more or less subject to the irregular movements. Several members of the family have had either fits

or chorea. Treatment: cold douch at night, and the tincture of steel three times a day.

Case 16.—Female, aged 9 years; admitted September 10th, 1866; discharged November 5th.

This child awoke up from her sleep in a state of terror, about eight days ago, and it was noticed that on her getting out of bed she was unable to stand, and could not control the movements of her arms or legs. Has now lost power over her speech, and has great difficulty in swallowing her food. Has had seat worms during the last six months, and has got very thin latterly. Treatment: tincture of iron, with infusion of quassia, and compound jalap powder.

Case 17.—Male, aged 11 years; admitted June 11th, 1867; discharged August 26th. Had scarlet fever when five years of age; two years ago had an attack of chorea, and was attended at home. On admission, both sides of the body were choreic; tongue clean; bowels regular; heart's action irregular, a loud systolic bruit being heard over its base. Treatment: the ammonio-citrate of iron, in five-grain doses, three times a day. Left the hospital quite free from chorea, and had no abnormal heart sounds.

Case 18. — Male, aged $10\frac{1}{2}$ years; admitted August 20th, 1867; discharged November 4th. A tall, slender, anæmic looking lad. Has had chorea for three weeks. On coming into the Hospital, this boy was in a deplorable state, unable to talk or stand, and was with great difficulty fed. The bed had to be padded, in consequence of the violence of his movements. A loud double bruit was heard on auscultating, the cardiac dulness was much extended, and there was very tumultuous action of the heart; the breathing was rapid; the jaws were snapped together with great noise. The tincture of Indian hemp was given in five-minim doses every four hours, with great benefit; iron was at the same time administered. He got better of the chorea very gradually,

there being persistent mitral disease and chlorosis. There was no history of rheumatism or scarlet fever.

Case 19. — Female, aged 9 years; admitted January 27th, 1868; discharged cured April 20th. Pale, delicate looking child. Chorea is attributed to a fright which she received at school. Both sides of the body are choreic. Has no heart disease.

Treatment: compound jalap powder; tincture of iron for two weeks, when strychnine was given for six weeks, in gradually increasing doses. There being no improvement, iron was resumed, and she was discharged quite well, after having been nearly three months under treatment.

Case 20.—Female, aged 11 years; admitted June 4th, 1868; discharged cured. A healthy-looking brunette. Eight weeks ago, it was noticed that she was continually pushing out her tongue. This soon became complicated with twitchings of the mouth, and a sensation as if a ball was rising in her throat. Soon after, she began to complain of pain in the right leg and arm. This was followed by choreic movements of these limbs.

Had scarlet fever five years ago, but made a good recovery. Her brother had a nervous attack when two years of age, brought on by a fright. On admission, she had well marked chorea of the right side; is very hysterical, and complains of a rising in her throat. Has pain in the right leg; is well nourished; has no abnormal heart sounds. Tongue clean; pulse 110, regular, but feeble. An aunt and a cousin had to be confined in Rainhill asylum, with maniacal chorea. Treatment: eight minims of the tincture of steel, three times a day, with a tepid douch at bed-time.

Table of Age and Sex of Forty-one Cases of Chorea, admitted to the Liverpool Infirmary for Children.

Age.	Male.	Female.	Total.
2 years	...	1	1
4 ,,	...	1	1
5 ,,	1	...	1
6 ,,	1	...	1
7 ,,	2	2	4
8 ,,	3	1	4
9 ,,	4	3	7
10 ,,	2	5	7
11 ,,	3	10	13
12 ,,	...	2	2
	16	25	41

Remarks.—It will be seen, on reference to the table giving the age and sex, that there is a much larger proportion of females than males, viz., 25 of the former to 16 of the latter. This excess of females is not noticeable until we arrive at a certain age, up to which the males exceed in number the females. Thus, under ten years, we have 11 males and 8 females; while, over that age, we have only 5 males to 17 females.

It is interesting to notice that in eight cases the cause given was either fright or mental distress. Case 2 is an example, in which the evidence of fright being the cause is beyond doubt; and the fact of the infant brother dying in a fit is suggestive of an hereditary disposition to disorder of the nervous system.

Heart disease was discoverable in four cases (4, 7, 17, 18), and in two has persisted to this date.

Most of the children were wanting in stamina, and had not enjoyed good health for some time previous to the attack.

In some cases (8, 15, 20), several members of the family had suffered, either from chorea, hysteria, or fits; in one (20), an aunt and a cousin had been in confinement for maniacal chorea for two or three months, and the mother stated that she was often very hysterical.

The duration of the disease varied from 11 to 120 days, the average being about 59 days. This is giving the utmost limit, as the children were, in all the cases which have been given, kept under treatment until quite well.

The *treatment* pursued has been, for the most part, simply with the view to improve the "general tone," as the chorea seemed to depend upon much the same condition as we find in hysteria. The drug most likely to answer this purpose is iron, and of its preparations, the tincture of steel, or the ammonio-citrate of iron, answers the best. When a sedative was required, the tincture of Indian hemp proved most useful, producing calm and quiet sleep at a time when the case seemed hopeless from the unceasing jactitations. The cold or tepid douch every night before going to bed is an important addition to the treatment, and produces a remarkable sedative effect, and in all cases where it was used seemed to be of great benefit; in no case was the shock which it produced injurious.

Bromide of potassium was administered in one instance (Case 2), but, as it was a case of only slight chorea, one could hardly form an estimate of its value. Attention to the state of the alimentary canal is in all cases imperative, as usually the bowels act very irregularly.

In cases 9 and 10, strychnine was given in gradually increasing doses, but with an unsatisfactory result, the patients making no improvement during its exhibition.

There is no doubt that the tendency in this disease is to convalescence, except in rare cases, where the chorea depends upon some serious lesion of the nervous centre.

Judging from the cases which have come under my notice, the disease seemed only to exist while the vital powers were below par, and immediately on there being an improvement in the general health, the symptoms of chorea began to abate.

I have no doubt that the drugs which have been so much praised for their good effects in curing this disease have produced this result by their alterative or tonic action, combined with, what is of the utmost importance, a good nourishing diet.

NOTE ON THE ESTIMATION OF STRYCHNIA.

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In the absence of any published method of accurately determining the amount of strychnia in organic fluids, it may be useful to describe the process for estimating this alkaloid which I have adopted during the last two years. This method has been employed in several cases of interest, the most recent of which is noticed in the present volume, by Mr. Puzey; and it has been found to yield results which are correct to the $\frac{1}{500}$th of a grain.

Description of the process.—The alkaloid is first isolated by a modification of Stas's well known method, using chloroform instead of ether as the final solvent. The residue adherent to the dish after the evaporation of the chloroform is then carefully dissolved in very dilute and pure hydrochloric acid; the liquid is transferred to a beaker and the dish is washed into the beaker with water acidulated with hydrochloric acid. To this solution, containing a salt of strychnia, there is added a quantity of solution of the iodides of mercury and potassium sufficient to precipitate all the strychnia. The precipitant is best prepared by dissolving 271 grains (1 at.) of pure corrosive sublimate, and 996 grains (6 ats.) of iodide of potassium in a gallon of water. The white precipitate is allowed to stand for some time to settle, and the liquid is then decanted into an accurately weighed filter of Swedish paper; the precipitate is washed with water, the washings being passed through the filter, and finally it is brought upon the filter, washed, dried at 212° Fah. and weighed. The weight found *minus* the weight of the filter paper is then multiplied by the factor 0·365; the product is the amount of strychnia. The factor 0·365 is found thus:—

The white precipitate consists of C_{21} H_{22} N_2 O_2 H I, Hg I_2, the molecular weight of which is 916; the molecular weight of strychnia is 334.

Therefore as 916 : 334 : : 1 : x

$$= 0{\cdot}365.$$

Thus every unit of the white precipitate contains 0·365 of the alkaloid. A similar precipitate occurs in the case of other alkaloids, *e.g.* brucia; and it is therefore desirable to prove the presence of strychnia in the precipitate. Caustic potash does not decompose it, and the alkaloid cannot be separated out; but the ordinary tests may be applied to the dry precipitate; the addition of a drop of concentrated sulphuric acid only occasions a brown colouration which does not interfere with the development of the purple tint on the addition of a crystal ferricyanide of potassium nor with the subsequent play of colours which constitutes what is known as the colour-test of strychnia.

A standard solution of iodide of mercury has been employed volumetrically by Winchler of Darmstadt, and Mayer of New York, for the estimation of alkaloids; but the volumetric method does not admit of the same accuracy as the gravimetric method detailed above.

Verification of the process. To test the accuracy of the process, trial experiments have been made with known quantities of strychnia. A centinormal solution was prepared by dissolving ·334 grammes of pure strychnia in 100 cubic centimetres of water acidulated with hydrochloric acid;—10 c.c. of this solution contain ·0334 grammes, or 10 measured grains contain ·0334 grains of strychnia.

With this solution, the following experiments were made:—

	Strychnia taken.	Found.
I.—10 c.c. containing	·0334 grammes.	·03358
II.—10 c.c. ,,	·0334 ,,	·0321
III.—20 c.c. ,,	·0668 ,,	·0675
Mean . .	·04453 ,,	·04439

Difference . . . . ·00014 grammes.

This difference calculated into grains equals $\frac{1}{500}$th of a grain.

ON THE MECHANICAL AND PHYSICAL EFFECTS OF NARCOTICS ON THE BRAIN,

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It is probable that many medicines, the ultimate effects of which on the animal economy seem to be similar, and which are therefore classed together in a common category, differ widely in the manner of producing such effects; some, for example, acting immediately on the textures to which they are carried by the circulation, and doing nothing more, while others have superadded to this their primary action secondary and collateral effects of a very marked character. Increased or diminished pressure of blood, increased or diminished rapidity of its flow, and many other analogous conditions are such indirect effects; and these sometimes are so considerable as to be of equal importance with the more direct chemical actions produced by the medicines that cause them.

In the following paper, I shall briefly detail a few observations and experiments which I think serve to illustrate the above proposition so far as the action of some of the chief agents usually termed narcotics is concerned. It should be stated perhaps at the outset that all the experiments were made on rabbits; and that by the expression, "mechanical and physical effects," is meant such changes as could be observed by the naked eye in the colour or size of a portion of the brain exposed by the removal of the superjacent bone and dura mater. The agents employed to produce insensibility were sulphuric ether, chloroform, carbonic acid, carbonic oxide, nitrous oxide (or laughing gas), the vapour of bisulphide of carbon, morphia, and atropine. Other narcotics would have been also used had time permitted. It will be only

necessary to narrate the first experiment in detail, as in the general method of proceeding all the others resembled it. It was performed on August 22nd, 1866, for the purpose of determining whether there was any variation in appearance in the brain of an animal rendered insensible by the inhalation of sulphuric ether. Anæsthesia having been first produced by means of chloroform, a crucial incision was made in the scalp, and then a triangular piece of the skull cut through with a very fine saw. This was removed as carefully as possible, as well as a piece of the fine dura mater corresponding to it in size, the blood stanched, and the animal allowed to recover. When sensibility was completely restored, there was nothing unusual observable in the exposed brain. It was of the ordinary light colour, and its upper surface just fitted against the inner face of the cranial bones, being neither protruded through the artificial orifice, nor depressed within the cranium; while the little blood that oozed was of a bright arterial hue. Sulphuric ether was then administered by inhalation (care being taken during the administration not to exert any pressure on the neck), when the following changes were observed. The brain became forcibly protruded through the opening in the skull, till it stood out as a tense tumour considerably above the external surface, concomitantly with which change the blood rapidly acquired a dark purple colour, that contrasted very strongly with the bright hue of a minute or two previously. The ether was then removed, and after a short interval chloroform substituted with exactly the same result. On removing these, and allowing the animal to recover, the brain speedily sank to its ordinary level, and the blood regained its bright appearance.

This experiment was performed several times, and on several different rabbits, with as much care as could be used, and always with similar results — a tense tumour of the brain, and a very dark colour of the blood, being uniformly produced. What do these two changes signify? And are they connected with the causes of the insensibility or not? The explanation generally, and probably truly, given of the deepened colour of the blood in the vessels would be that it is due to a non-oxygenation of that fluid, and to its being in the condition of venous, rather than of arterial blood. Whether

a mere alteration of colour, all other things remaining unchanged, could produce anything like the intensity of tint observed in the cases mentioned is perhaps fairly open to question. It seems probable that for the production of such an effect there must be congestion. Capillary vessels must be distended. The corpuscles, instead of moving in swift succession, must be brought to a standstill, or at most roll but sluggishly forwards. Does congestion exist in the brain of the rabbit when narcotised by chloroform? And, if so, will it explain the forcible protrusion of the cerebral mass which was witnessed? This protrusion was such that the brain must have been subjected to considerable pressure, notwithstanding that it was free to expand to a certain extent through the artificial opening. Of course, if no such opening had existed, the compression would have been still greater. Was this protrusion secondary to congestion, and the congestion itself secondary to a condition of stasis following from the retention of an abnormal amount of carbonic acid in the blood; and had either or both conditions anything to do with the production of insensibility? These are questions which I would suggest rather than presume to answer. I do not venture to affirm that the effects observed on the rabbit would be seen in man; though, in the absence of any such difference in the cerebral circulation in man and the rabbit as would seem competent for the production of so great a difference of result, it seems probable that they would.

This may be confidently said, viz., that whenever rabbits are rendered insensible by the inhalation of chloroform or ether, the contents of the cranium are greatly increased in bulk and the colour of the blood much darkened.

Carbonic acid and carbonic oxide differed somewhat in the symptoms they produced, though the effects on the brain seemed to be similar. The former agent was employed by burning a pan of charcoal in a close bin in which the rabbits were confined; the latter by passing the gas through a delivery tube into a large inverted glass jar containing the animal, after generating it in the usual way by means of oxalic and sulphuric acids, and depriving it of carbonic acid by solution of potash. Under the influence of the carbonic acid, there was simply a gradually

increasing somnolency ending in deep narcotism; whereas, when the carbonic oxide was breathed intense excitement came on, the creature making the most violent efforts to escape from the jar, though these efforts were speedily followed by complete insensibility. In both cases there were the same appearances in the brain as when chloroform and ether were used.

That such physical causes of narcotism as the conditions of the brain in the cases already noticed might seem to suggest are not, however, essential to the production of that state appears evident, from the absence of such conditions when some other agents were employed. When two grains of morphia, for example, were administered by subcutaneous injection, and the brain exposed, there was neither protrusion nor change of colour. Nor when—the animal being still under the influence of the morphia—a solution of atropine was injected, and the pupil made to pass under its influence from a state of contraction to one of extreme dilatation, was any change observable. Of course it is not pretended that this kind of experiment is sufficient to disprove the production of very different physical conditions by the two alkaloids, morphia and atropine, in the parts through which they circulate. Changes of a kind too minute to be observed with the naked eye might or might not be caused. So far, however, as mere unaided observation goes, their physical effects are similar. I might remark here, in corroboration of careful observations long since made by others, that the action of atropine was much more evanescent than that of morphia. The pupil was contracted under the influence of the latter. The atropine was then introduced, when it became dilated; but the dilatation passed away, and was succeeded by contraction caused by the original dose of morphia.

The three remaining agents, viz., sulphuretted hydrogen, nitrous oxide, and the vapour of bisulphide of carbon, were passed into the inverted glass jar containing the rabbit, just as was the case with the carbonic oxide. Under the influence of the first of these there was no excitement whatever. As it mingled in greater and greater proportion with the atmospheric air in the jar, intense drowsiness, ending in deep coma, came on; and, concomitantly

with the supervention of this state, the blood around the wound in the cranium became of a deep black colour. The change was greater than in any of the other cases, the colour being quite pitchy. But though I looked carefully, I could not see any protrusion of the brain.

When nitrous oxide was breathed, by another rabbit, in the same jar, there was on the contrary great protrusion, but no change of colour, although as deep an insensibility was produced. In this case also the effect was very evanescent; for in three minutes after exposure to the air the rabbit was up and running about, whereas the one which had breathed the sulphuretted hydrogen never rallied from the coma.

The vapour of bisulphide of carbon was given by soaking a small sponge fixed in the top of the jar with the liquid bisulphide and then inverting it over the rabbit. The vapours instantly diffuse themselves in such a case. The first symptom was intense excitement. Violent efforts were made to escape, which were followed by convulsions and coma. Here again there was no perceptible protrusion of the brain. There was a good deal of pulsation in its vessels, but, though it could be plainly seen beating against the inner face of the cranium, it was never forced through the orifice that had been made. Nor was there any *great* change in the colour of the blood. It certainly was a little darker than natural, but not nearly so dark as in many of the other cases.

The experiments related were undertaken with a view to ascertain by such means as were employed, and so far as it was possible to ascertain by such means, whether there might not be a physical cause,—as, for example, pressure,—for most cases, as there undoubtedly is for some cases, of narcotism. Against such an idea they certainly seem to militate, the physical conditions of the brain which follow the administration of the narcotic agents being so very dissimilar. There is nothing, however, in them to disprove the idea that, in cases where pressure and other competent conditions do exist, they may be causes, if not the main causes, of the insensibility. The narcotism induced in the three rabbits, beneath whose skins I injected morphia, was not so deep as it

was in those animals which were made to breathe one or other of the gases; and this may possibly account for some difference in the appearances. In ten minutes after the injection of a solution of two grains of morphia, a half grown rabbit lies utterly unable to move, breathing very slowly, but having its eyes partly open. The removal of a portion of the cranium seemed to give no pain under such circumstances. The introduction of the atropine was not followed by any diminution of the coma; and two of the animals died within two hours, uttering a cry and being convulsed immediately before death.

ON REST AND POSITION IN THE TREATMENT OF MEDICAL DISEASES,

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The importance, nay the absolute necessity, of rest, mechanical or physiological, in the treatment of a large number of diseases of a surgical nature has long been recognised, and, by the comparatively recent labours of some eminent observers, the whole subject, so far as regards these affections, has been most ably worked out; but among those diseases considered as more strictly medical, the application of this principle has been anything but extensive, and it appears to me that, though of course its usefulness must be necessarily much more limited where internal organs are affected, whose constant action is essential for the maintenance of life, than in those cases where external parts are implicated, which can be relieved from the performance of their ordinary functions without interfering with the existence of the patient, yet there are many diseases, frequently too of a grave character, in which rest and position exercise a most important influence for good, not only in aiding the action of other remedies in the direction of recovery and preventing the occurrence of complications, but also themselves sometimes actually leading to a cure, and not unfrequently relieving symptoms and prolonging life, where recovery is not to be hoped for. It shall be my endeavour, so far as space will admit, to consider the subject in relation to some of the more important affections which are met with in ordinary medical practice.

There is hardly any acute disease more commonly met with, or of a more distressing character, than Acute Rheumatism. So

far as the joints are concerned, there is no necessity of enjoining rest, for the patient will find it not only absolutely necessary to keep quiet on account of the pain which movement produces, but will often be unable to move in the slightest degree, there being not only an unwillingness to stir, but a condition of almost absolute helplessness; but even here it will often be found, that position, and proper arrangement of the limbs on soft pillows, aid materially in lessening pain, and securing the comfort of the patient,—a by-no-means undesirable end, seeing that the pain in this affection exercises a most depressing influence upon the patient. It is, however, principally on account of its tendency to implicate a most important internal organ, viz., the heart with its investing membrane, that I allude to this disease. Endocarditis and pericarditis are what we most fear, as being complications not only dangerous in themselves, but also leading to after-consequences of a very serious nature, and therefore it ought to be our chief aim and duty to ward them off by every means in our power. One of the most obvious of these means is to endeavour to keep the heart in as quiet a position as is practicable. Though the inflammation which affects the endocardium or pericardium is principally due to the circulation of a poisoned blood, yet it cannot be doubted that, in proportion to the degree of rest which can be procured for the heart, the less will be the chance of these membranes becoming involved.

In a former volume of the *St. Bartholomew's Hospital Reports*, Dr. Farre advocates the free administration of opium in cases of rheumatic pericarditis, with the view of keeping the heart quiet; I would go a step further back, and say, that in order to *prevent* the advent of any inflammation about the heart, opium should be given with the same object, viz., to produce a constant sedative action upon this organ. It is a drug very generally used in cases of acute rheumatism, but only with the view of relieving pain, and it is therefore not given to the necessary extent. I generally give it in the form of a pill, containing one grain of opium, and this is repeated from every eight to every three hours, according to the requirements of the case. The results have been very satisfactory; for, among a large number of cases of acute rheu-

matism admitted into the Northern Hospital under my charge, there has not been a single instance in which either endocarditis or pericarditis developed itself while the patient was in the hospital, and I cannot but attribute this, at all events in part, to the extensive use of the opium, combined with measures for maintaining the most absolute rest of the body, and the avoidance of anything in the diet of a stimulating nature. I have had no experience of the employment of digitalis or the veratrum viride, which doubtless would be very valuable as sedatives to the heart; but they have this objection, that they are very depressing agents, and the patients are as a rule quite depressed enough, especially in hospital practice, while opium has the further advantage of relieving the pain which is such a source of suffering.

When inflammation affects the peritoneum, one of the main principles of treatment which has been long recognised is to maintain the surfaces in as complete a state of rest as possible, and with this end in view, the peristaltic action of the intestines is entirely checked by the free use of opium. I have already alluded to its employment as a sedative to the heart, when the pericardium is similarly affected; but there is one serous membrane, viz., *the pleura*, in the treatment of inflammation of which the idea of procuring rest has hitherto been entirely overlooked. In cases of synovitis affecting joints, this is one of the chief points to which the surgeon attends, and the condition of things in pleurisy bears a sufficiently close resemblance to those met with in synovitis to suggest to us that the same principle might be adopted with advantage. Obviously, if the friction of the inflamed surfaces against one another can be prevented, or even considerably diminished, they will be less likely to pour out the large amount of lymph and fluid which often produces such lamentable consequences, and will be left in a far more favourable condition for the absorption of whatever fluid may be exuded, and for rapid adhesion to take place, before the lung becomes compressed to such a degree that it cannot recover itself. Any one who has seen a case of acute pleurisy in the early stage, cannot fail to have observed how the patient instinctively restrained the movement on the affected side, and must have felt that if, following the hint

thus given, he could aid by any means in keeping the side motionless, he would be conferring a great boon, both in relieving the symptoms which cause so much distress, and leaving the parts in a condition for passing through the several stages of the inflammation in a manner most conducive to the well-being of the patient. This object can be carried out, to a great degree at all events, by *mechanical means;* and I would suggest that one of the first things that should be done, in the early stages of pleurisy, is to limit as far as possible the expansion of the affected side, taking care however to leave the healthy side quite free to perform its duties. In order that this principle may be successful, it must be carried out effectually, and the plan that I adopt is as follows:— strips of emplastrum roborans, about five inches wide, are laid firmly over the affected side, extending from the spine behind, round to the middle of the sternum in front, and covering the whole side, from the upper part of the chest down to the lower margin of the ribs; over these two or three layers of strips of bandage, of the same length, and soaked in a mixture of gum mucilage and chalk, are placed, also with considerable firmness; the whole is then rapidly dried by applying heated sand-bags, and thus in a very short time a firm casing is formed, almost completely preventing movement on the one side, while it leaves the other quite free to expand. It may be objected to this that it is difficult of application, and not conducive to cleanliness or comfort; but practically it will be found that it can be easily applied, and, with a little care, without interfering with the above conditions. But even if these objections were valid, they are not of sufficient importance to deter us from adopting this treatment, provided it can be proved to be of service in obviating those dangerous results, which now by no means seldom follow an attack of the disease under consideration. Of course any other plan might be carried out, if it effectually secured the desired rest, and there need be no interference with the medical treatment which any individual practitioner might feel inclined to adopt. Contrary to what is stated in some standard works on diseases of the chest, my experience has been that *acute idiopathic pleurisy* is not a common disease, even in hospital practice, and it is still

more rarely met with in its early stages; consequently, the opportunities I have had of testing the effects of this treatment have been so far very few; and I throw it out more as a suggestion for future trial than as one the value of which has been established by extensive practical application; at present I have but the results of two cases to record, but in these the means adopted seemed to answer very well, and the termination in each instance was exceedingly satisfactory. The first case in which I tried it was that of a rather elderly man, who was admitted into the Northern Hospital suffering from the usual pleuritic symptoms, the pain being very intense, and there was loud friction-sound to be heard. On applying the plaster and bandage as previously described, the pain was at once greatly relieved, a sense of ease and comfort was felt, and the breathing became quiet and regular, entirely losing its 'catchy' character. The subsequent course of the case proved equally satisfactory; very little, if any, fluid effusion took place, and the patient was discharged within a week quite convalescent. No medicine was given except a little opium. The other case was that of a young man, who, when admitted into the hospital, was also suffering much pain, but he had been ill for some days, and some fluid had been poured out. A similar application was made, and with the same favourable results, the fluid having been soon sbsorbed, and a speedy cure brought about. It is, however, not only in cases of pleurisy that this principle of keeping the chest at rest is of use, but it is also advantageous in certain other conditions; thus in *pleurodynia*, often an exceedingly troublesome and painful affection, I have found it of much benefit; and in a case of *pneumothorax*, resulting from the rupture of a tubercular cavity in the lung, it proved of the greatest service in relieving the urgent symptoms which were present. In this case, the right side was enormously distended and tympanitic, the liver being considerably displaced downwards and to the left; there was extreme pain, especially when the patient coughed, which he did very often, though he felt as if he had no power to perform the act, and tried to assist it by pressing on his side with his hands — a constant sense of urgent dyspnœa was felt. The effect of fixing the side was to give *immediate* and *marked* relief to these

symptoms; and although the issue in such cases must necessarily be almost certain death, yet, bearing in mind that it is the duty of the physician to alleviate suffering, as well as to restore to health, I think that the treatment I am now advocating is of great importance under circumstances like those described above.

Though perhaps belonging rather to the domain of surgery, I would say a few words here with regard to *chronic inflammation of the larynx*. It has for some time struck me, from observation of several instances of it, that it would be very advantageous in such cases to perform tracheotomy at an early period, with the view of affording physiological rest to the larynx, thus placing it under more favourable conditions for being restored to health; and I am glad to find that this treatment has recently been well advocated by Mr. Bryant. But I am of opinion that this principle ought to be extended further, and that, whenever there is chronic ulceration at the back of the throat of an extensive nature, and *threatening to invade upon the larynx*, as shewn by interference with the act of breathing, hoarseness, &c., if the results of treatment are not *speedily* favourable, tracheotomy should be had recourse to, as not only leaving the parts in the best possible state for being healed, a result which is otherwise obstinately resisted, but also as saving the patient from the risk of sudden death, which is apt to occur from œdema of the glottis, followed by spasm. A case of this kind recently happened under my care at the Northern Hospital, in which sudden death took place, though there were no specially urgent symptoms; the upper part of the larynx was found to be œdematous, and evidently a momentary spasm had completed the mischief. This and similar instances which have come under my own notice, and been mentioned to me by others, have impressed upon me the imperative necessity of having early recourse to tracheotomy, or perhaps laryngotomy, under such circumstances.

Dropsy is a symptom common to several forms of disease, and the principles of its treatment have to be guided to a certain extent by the nature of its cause; but there is one very important point that ought to be attended to in all cases, but which has not

received the attention it deserves, and that is the *influence of position and rest.* In some affections, dropsy constitutes one of the most serious symptoms, not only itself causing much uneasiness, but also leading to an unhealthy condition of the blood and system generally, and hence nothing that can in any way assist in its removal should be disregarded. It is of course especially when anasarca of the lower extremities or scrotum exists, that the results of position and rest are best seen. In such cases the legs should be kept *continuously,* and *for a long time,* in fact, until quite restored to their natural state, in the horizontal position, or even somewhat elevated above the level of the body, so that the fluid might not be under the influence of gravitation, while the scrotum should be raised by means of a soft pillow. It is not sufficient to attend to this for a brief period, or interruptedly, but it must be *persevered in;* and it is also of great importance not to neglect it in the early stages, before the fluid has collected to any great extent, for it is then that its effects are most marked. Cases are not unfrequently seen in which considerable diminution of the anasarca takes place during a night's rest; but, the patient being allowed to walk about during the day, it becomes as great as ever before evening, and thus no real progress is made, the vessels having to perform the same duty of absorption night after night, while they are hindered from regaining their tone and returning to their healthy normal condition. By obviating the re-accumulation of the fluid which has already been absorbed, the action of other remedies is materially assisted, while the vessels are left in a far better state for taking up what remains. In order to carry out this principle, it is not necessary that the patient should be confined to bed, indeed it is important in many cases that he should get up, all that is required being that the legs be kept on a couch or form, and not allowed to hang down. In some instances position alone, or merely combined with good diet, is sufficient to remove dropsy; thus several sailors from the same ship were admitted into the hospital with considerable œdema of the legs, for which no particular cause could be found, and they were all discharged in a few days, cured by rest and nourishing food. The dropsy of anæmia is also as a rule speedily

removed by position; and I have found attention to this point productive of much benefit in that resulting from cardiac or renal disease.

One very important means of relieving dropsy, that of Bright's disease more especially, is to act freely upon the skin by the aid of some form of bath, particularly the hot air or vapour bath; but it seems to me that the use of the bath in Bright's disease is not limited to the treatment of this symptom, but that it is a powerful means in our hands of taking away from the kidneys much of their labour, and thus keeping them in a state of physiological rest. It is a well-known physiological fact, that the functions of the kidneys and skin are performed in an inverse ratio, the one being active when the other is inactive. If then we can get the skin to excrete profusely, we shall by so much diminish the work the kidneys have to do, and thus necessarily leave them in the most favourable condition for being restored to health if the disease be not too far advanced, or at all events aid in retarding its progress. On this ground, I would advocate the regular and frequent use of some form of bath in cases of Bright's disease, *quite independently of the existence of dropsy*, and, if it could be had, none would act so well as the Turkish bath; but if not, the vapour, hot-air or warm bath might be substituted. From the observation of a large number of cases of chronic renal diseases, I have been led to the belief that it can often be traced, in the lower classes, among whom it is very prevalent, to the long-continued neglect of keeping the skin in a proper state of cleanliness and activity, especially when this is associated with habits of intemperance; the consequence is, that the skin ultimately ceases to act at all, its glands become blocked up, and perhaps in some cases undergo degeneration, and thus extra work is thrown upon the kidneys, leading at last to disease, which can therefore be best counteracted by endeavouring to excite the skin to the performance of its normal functions.

There are many other diseases in which rest proves a valuable aid towards recovery, and in which its influence has been to a certain extent already recognised, though it is still too often not attended to as it deserves, being merely looked upon as an agent

of secondary importance. Space will not permit me more than just to allude to a few of these. In the various forms of internal hæmorrhage, such as hæmoptysis and hæmatemesis, what appears to me of far greater moment than the administration of astringents, is to keep the patient in the horizontal posture *for some time*, quite free from all disturbing causes, and to lower the force of the circulation by means of a limited diet, and the use of such medicines as opium or digitalis. In the case of hæmatemesis, all solid food should be avoided, only small quantities of fluid being given, and indeed for a time it will be well only to allow the patient to suck ice. These measures should be continued until the ruptured vessels have had time to recover themselves, and all fear of recurrence of the bleeding is past. Attention to the matter of diet, with the view of affording physiological rest, is also of primary moment in the treatment of various affections of the stomach and intestinal canal, such as dyspepsia, chronic ulcer of the stomach, the ulceration of typhoid fever, &c.

Even as regards diseases of the brain and its membranes, though the removal of everything that can disturb the body, mind, or senses has always been considered important, at least in those of an acute nature, still it is not as a rule insisted upon to the extent it ought to be, particularly in chronic cases. There is no doubt that it is a point of the greatest consequence to attend to, and therefore it should be fully carried out, and that not merely for a brief period, but for a long time, even after apparent recovery has taken place. In chronic cerebral diseases, the desirability of mental quietude, intellectual and emotional, should be deeply impressed upon the patient, as affording the only chance of recovery; if neglected, it may lead to an acute complication, which would soon end in death. I have met with more than one instance in which some mental disturbance, generally of an emotional character, has been the cause of an acute attack, which has led to a rapidly fatal issue.

CLINICAL REMARKS UPON SYMPATHETIC IRRITATION AND INFLAMMATION FOLLOWING INJURIES OF THE EYE,

By T. BICKERTON, F.R.C.S. Ed.,

SURGEON TO THE LIVERPOOL EYE INFIRMARY.

No subject of surgical interest can hold a more important place in the mind of the surgeon than the consideration of the effects of injuries to the eye and its surrounding structures. Large numbers of such cases are continually coming under observation, both in hospital and in private practice, and I have selected from amongst them examples of several forms of such injuries, with their results, illustrative of the several phenomena most commonly observed in the progress of such cases generally. It will be necessary for us to bear in mind the nervous connections of the eye and its appendages, in order that we may better explain the several dangerous complications and conditions known as "sympathetic inflammation," and understand how they are brought about.

In regard to the power we possess of seeing one object with both eyes, anatomists explain it by the decussation of the fibres from both optic nerves, which takes place in the chiasma, or optic commissure. Thus each retina is composed of fibres coming from the two optic nerves; and as the one possesses, in common with its fellow, a special function, in the same manner does it participate in, and is influenced by, altered and diseased conditions affecting the other.

Furthermore, we must notice the very intimate and close connection that exists through the several nerves supplying the eyes with motion and sensation, and to this is due the sympathy in disease; in fact, we find that what is common to them in a healthy condition is also common to them in diseased states.

The eyes also receive a large supply of nerves directly from the sympathetic system, which are chiefly concerned in their nutrition; and, with reference to this system, Dr. Carpenter remarks, "It is well known that the sympathetic system is largely distributed upon the trunks of the blood-vessels, accompanying them to their minutest ramifications;" and again, "that these vessels contain an independent capillary power of regulating the supply of the circulating fluids, which is closely connected with the state of the nutrition and secreting processes." The interference with nutrition following injury to nerves is well evidenced in some consequences which have followed injuries to particular nerves. Thus division of the fifth pair of nerves, without any immediate mechanical injury to the eye, has been followed by death of the cornea; whilst injury to the spinal marrow may give rise to sloughing of distant parts, by interfering with nutrition directly through the sympathetic system of nerves.

With these few preliminary remarks, I will proceed to allude to some of the more mischievous consequences I have noticed, and which have led me to a close and anxious study of such conditions.

My observations induce me to believe that amaurosis following injuries to nerves at a distance from the eye itself, viz., about the head and face, is of the most hopeless character, and I have never yet found any form of treatment capable of arresting ultimate blindness. Fortunately these cases are comparatively rare. I will give the history of such a one; but, as they resemble one another in a remarkable manner, running much the same course, varying only in different constitutions, habits, and in extent, and as a rule ending in blindness, it would be useless multiplying them.

Miss M., when eleven years old, sustained a deep and severe injury of the forehead, implicating the right supra-orbital nerve. Ever since the accident she has suffered from severe *recurring* pain around the right eye-ball, vision becoming dimmer after each attack. During the attack the eye-ball becomes red and bloodshot, and very painful to the touch. A few days rest, with treatment, usually restores her eye to quietude. This condition

has gone on for eight years, and now (1865), vision in it is almost gone, and the *left* eye has lately suffered from the same symptoms, and she feels that it is passing into the same condition as the other, and that she will become blind. Excision of the cicatrix in the forehead, with a portion of the supra-orbital nerve, was proposed, but she declined to submit to an operation. I never after saw the poor girl, but have no doubt of the ultimate result of the case. The pathological conditions, observed by the ophthalmoscope, are, as a rule, simple atrophy of the retina and choroid, the gradual effects of "altered nutrition," the clear media of the eye, as well as the irides, looking apparently perfectly healthy.

Such cases are in great contrast to the forms of amaurosis following injuries to the eye-ball itself, where we see, after injury to one eye, the acute plastic forms of inflammatory action occurring in the other uninjured eye, which, though beginning slowly, soon assume the glaucomatous character, passing, generally, if not arrested by the most active management, into a state of general agglutination of the tissues by the organisation of the products of the inflammatory action. The iris, capsule of the lens, altered lens tissue, and the vitreous body itself, are all bound inseparably together, and the anterior and posterior aqueous chambers become more or less obliterated. The eye-ball, in the early stage, feels hard and full, but later on, when utter and complete destruction of function is effected, it shrinks to a mere stump. Patients having an eye in such a condition frequently apply for something to be done, as they *feel* that there remains some little power of vision, and they often beg for any operative procedure which may give them even a chance of restoration to useful vision. The following is a fair specimen of this form of mischief.

A young man, while at work, was struck on his right eye by a piece of iron flying off the chisel head, twelve months before I saw him. The cornea was severely lacerated, the iris prolapsed, and lens torn and dislocated. Acute inflammation followed the injury, which did not subside for some months, and ended in complete destruction of all vision, and an atrophied

eye-ball, but with a clear corneal 'patch.' Three months after the injury to his right eye, the *left* began to suffer from sympathetic irritation; congestion, and, in fact, general eye-ball-itis, which is really the best term to apply, followed, and completed the destruction of vision in the uninjured eye. The cornea was clear, and he could perceive daylight with this eye. A year after the first receipt of the injury he was sent to the Eye Infirmary under my care. The *right* eye-ball is shrunk and soft. No perception of vision. The cornea has a clear patch, and the iris is seen through it, discoloured, tied together by old plastic organised lymph. No pupil. He says that he now only suffers occasional intermitting pains, which he feels at the back of the eye-ball, extending around it and going to the left.

The *left* eye-ball is fuller and harder than natural. The cornea is clear and rather flat; anterior chamber small. The iris is of a muddy reddish appearance, and has lost all its normal, muscular-like, striated character; it is fixed by false membrane, which appears like a complete veil stretched across the eye. The pupil is perfectly closed, and the pupillary margin completely lost in the plastic exudation tissue, which has now become organised. The margin of the iris is bound to the anterior capsule of the lens, which has become opaque and cataractous, thus obliterating the posterior aqueous chamber, and most probably involving the ciliary processes and hyoloid membrane. He can make out daylight, as well as the flame of a candle when passed before the eye. After warning him that most probably I should fail in making him an artificial pupil, he was glad to submit to any operative proceedings I thought likely to be of use. I endeavoured, by a free incision through the lower margin of the cornea, to cut out a good sized piece of the altered iris and false membrane, and to make him an artificial pupil. I caught, with forceps of different forms, piece after piece of the iris, and appeared to have at last made a good clear pupil, but on examining the eye, four days afterwards, though no inordinate inflammation had resulted from the operation, I found, as usual, the edges of the new pupil again coalesced,

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with scarcely any trace of the artificial pupil, excepting an apparent thinning of the iris and membrane at the central point. The man thinks the veil is thinner and the light stronger. A fortnight afterwards I again operated in the same manner, but with a similar result, the edges of the cut iris closing the new pupil. This is no uncommon case, but I believe almost the constant result, in these aggravated cases of acute sympathetic inflammation. I have been induced repeatedly to try again and again for the chance of affording some little good. Out of many cases, only in a few instances have I succeeded in giving relief. In one such, a labourer came to me after he had been operated upon nine times by different surgeons and in different places, and I was fortunate enough to succeed in establishing a clear small pupil, through which he was enabled to find his way about comfortably for eight years afterwards, when I lost sight of him. It was a good illustration, however, that want of success in one, two, or more attempts should not satisfy us in these cases, as it is frequently found that the small iridectomies, which these operations really amount to, have a beneficial effect; the irides occasionally improve after the first operations, and place the patient in a much better position for ultimate success, always providing that no shrinking of the eye-ball occurs, and that the power of the eye to discern day-light and passing objects before the eye remains.

If such results become in this class of cases almost a rule, it will readily be conceded that no effort upon the surgeon's part should be wanting to prevent these sad consequences to the patient, but that all due care, trouble and perseverance, for these cases are very tedious, should be exercised in their treatment. As medicines have utterly failed in arresting the progress of the disease, it is encouraging to find that surgery has within it the means at hand of giving relief to at least the majority of these cases, if it be applied sufficiently early, but boldly and without temporising; and I say it in no hesitating manner, from a long and sad experience in closely watching the course of these cases, that it is the duty of the surgeon, when he is called to such a case, and finds an eye utterly destroyed by

some injury, to excise it at once, just as he would amputate a limb crushed or mutilated to an analogous extent by mechanical means, or disorganised by disease; in fact, to reduce by his knife the wound to the simplest form consistent with the injury received. We place the patient in safety at once, in a week he is quite well, a glass eye removes the deformity, and all chances of sympathetic disease are for ever gone. Undoubtedly normal vision is seriously affected, but such a position of healthy vision with one eye will bear no contrast to the other side of the question, of utter and hopeless blindness.

W. F., gun-shot wound of the right eye. He was standing watching a pigeon shooting-match, 150 yards from, but opposite, the shooter. One shot penetrated the upper part of right cornea, iris and lens, and was lost in the eye-ball. He was sent to me next day. Feeling convinced that the shot was in the eye, and the eye utterly destroyed for all useful purposes, I wished to extirpate it at once; but, after submitting the case to a consultation, it was deemed better to wait for symptoms to arise in the left eye of sympathetic irritation before doing so; in three weeks after leaving the Infirmary the left eye became affected. I extirpated the right eye, and found the shot embedded in the choroid, retina, and sclerotic, about half-an-inch from the optic disc; he appeared to be relieved for a short time, but the relief was only temporary, sub-acute inflammation continued and ended in total blindness, and I think the poor fellow was nearly a year before all pain and irritation had subsided—with his health greatly impaired.

In September, 1866, a medical man was thrown from his horse while out visiting his patients, owing to his horse running away with him. He wore spectacles, and was pitched with his face against a load of sticks (cut hedges) lying upon the road side; his spectacles were broken into his eye, which was at once destroyed; cornea torn, iris, lens, and vitreous body escaped through the wound. His ankle was also broken. He lived some distance from Liverpool, and I was sent for ten days after his accident. I found him in extreme agony, with the eye-ball enormously inflamed and swollen, and standing prominently between the half open eye-lids. He was in intense pain, and felt

his other eye very tender and weakly. I at once recommended the destroyed eye to be extirpated, his friends would not consent, so I ordered the usual remedies in such a case; in about a week afterwards I was again requested to visit him. I found him in much the same state, but more exhausted and reduced; morphia and opium, with almost the continual administration of chloroform, affording him the only relief. He begged of me to remove the injured eye, as he felt that he should lose both if it were not done. I removed the eye, on the seventeenth day after the injury, and he felt immediate relief, and had no return of pain; he was quite well again *in ten days* so far as the eye was concerned, his ankle detained him much longer. I see him occasionally, he wears a glass eye, and his remaining eye is perfectly well, and vision in it as good as ever it was.

Another condition frequently presents itself to us in practice in cases where a patient has sustained severe injuries, destroying the usefulness of one eye, where no great sympathetic mischief arises for some considerable time afterwards, even as long as twenty years. I have such a case at this moment under my care, having the following aspect.

O. H., aged 50, a tall healthy-looking man, works in the Welsh slate quarries; twenty years ago he was injured in the left eye, by a piece of slate which he was spliting in the quarry; the cornea was lacerated, the iris prolapsed, and lens dislocated. He tells me that he bled considerably at the time, and was laid up in bed and confined to his house for four months, suffering great agony from the inflammation that followed. Vision in this eye was lost at the time of the injury, and never recovered; he has suffered from occasional painful attacks in the stump of the eye, but not to a severe degree until eighteen months ago, when he found that, after each painful attack in the old stump, the vision of his right eye became dim, the dimness increasing after each attack. Within the last few months, the right eye-ball has become red and inflamed; feeling that he was in great danger of losing the vision in his remaining eye, he came to me, and I advised the immediate excision of the left eye, and the man gladly consented, as he was quite satisfied that the condition of the

stump of the left eye was the cause of the mischief in his right eye. The case resulted most satisfactorily.

I have had a large number of very similar cases under my care, and I have treated them during the last four or five years by *excision* of the globe; but there is another mode of procedure, by what is called "abscision" of anterior half of the globe of the eye. This operation appears at the first view to be a simpler operation than excision of the entire globe; but it is not so, and it does not answer the purpose of giving complete permanent relief. Cutting through the sclerotic, the anterior parts of the choroid and retina, with the very great risk of the loss of the remains of the vitreous body and humour, is a far more serious matter than the mere division of the conjunctiva around the cornea, the six muscles of the eye, and the optic nerve; and in the time required for perfect recovery from the effects of the two operations is very different; an eye that has been abscised may be a month or two in recovering, while from the effects of extirpation of the eye-ball a few days, generally about a week, is all that is necessary; the beneficial effects of extirpation are felt at once, and remain for ever; of abscision, the relief is slowly felt, the cause of the mischief remains, and the mischief itself returns. The dissections of a great many eye-balls when this diffused sympathetic irritation has set in, has convinced me that it is entirely due to the dense fibrous structure of the sclerotic shrinking and *closing upon* the retina, which resents at all times all pressure upon its delicate structure, whether in the early stages of congestions of the eye, as in glaucomatous disease, or in the last stages of destructive disorganisation.

One more case will shew the treatment necessary to preserve the eye which is sympathetically affected from an early stage.

In October, 1866, I was consulted by a lady, aged 26, who had suffered from corneitis of the left eye when five years old. She was ill, off and on, for a long time with this eye, which eventually got well, with a dense nebula on the upper and inner position of the cornea, the iris being bound to the cornea. She could only discern light from darkness, and the general outline of large objects; in fact, she had no useful vision in this eye. After some

time, which she does not now remember, the right eye became painful and irritable, and for years afterwards she suffered attacks of inflammation in this eye, until it was completely destroyed and became staphylomatous. This was her condition when I saw her. I extirpated the right eye, and made a large clear iridectomy on the lower portion of the iris of the left eye, removing at the time the lens which was cataractous. Since the operation, the poor girl, with the aid of proper spectacles, can see remarkably well, indeed much better than she remembers to have done before, while a glass eye removes the deformity of the excised right eye.

CASES OF RECOVERY AFTER FRACTURE OF THE SPINE,

By W. H. MANIFOLD, M.R.C.S.,

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The following cases, I think, are of sufficient interest to bring under notice, as they afford further examples of recovery following a lesion which, as a class, we must regard as of a most fatal character. The word "recovery" is used necessarily in a limited sense, for though life has been saved, yet there are effects remaining which cannot be regarded as otherwise than permanent. In the first case, two years have elapsed since the injury, in the second, sixteen months, and in the third, sufficient time to permit of my drawing conclusions favourable to the life of the patient.

Fracture of the spine in the lower dorsal region.—Thomas P., aged 28, a sailor, in July, 1866, whilst at Quebec, fell from the ship's rigging on to the deck, a very considerable distance, alighting on his feet. He was removed to the Marine Hospital, where it was found that his lower extremities were completely paralysed. The urine had to be regularly drawn off, and he had no control over the contents of his rectum. He remained in this condition for three months, when sensation, followed by movement, began very gradually to return. In six months he was able to get out of bed and move about with crutches, dragging his legs, "almost as if they did not belong to him." He remained in the hospital until he was sufficiently recovered to return to England. He was admitted into the Liverpool Northern Hospital on September 2nd, 1867 (fourteen months after the accident). On admission he drags his legs a good deal, but is quite able to get about with the aid of a stick. Sensation is natural everywhere. Has full control

over the rectum, but occasionally has difficulty in passing his urine. The temperature of the limbs was as follows:

Upper extremities, 99¾ Fahr.
Lower ,, 78 ,,

there being a difference between the two of 21¾ degrees.

On examining the spinal column, the spinous process of the twelfth dorsal vertebra projects very considerably beyond the others, forming a well marked though small "hunch." On the left heel there is an ulcer, caused by a nail at the time of the accident, which has never got well, and for the relief of which he has come into hospital. The ulcer is deep, about the size of a sixpence, with hard callous edges. I removed some of the hard skin about the ulcer, had the legs galvanised, and the temperature raised by artificial heat, a stimulating ointment being applied to the wound. The ulcer took some time in healing, but he eventually left the hospital quite well, as far as the wound was concerned, and improved in general health.

It is interesting to observe the delay that took place in the repair of the injury to the heel, in consequence of the impairment of nerve force in the lower extremities generally. The alteration in temperature was well marked, and suggestive of the treatment that would be calculated to promote due reparative action, which since the injury to the spine had been in abeyance.

Fracture of the spine in the middle dorsal region.—Peter R., aged 41, a sailor, was admitted into the Northern Hospital on April 18th, 1867, suffering from an injury to the back, caused by a fall from aloft, a distance of some fifty or sixty feet. On admission his lower extremities were completely paralysed, the bladder and rectum being also involved. On examining the spine, no displacement could be detected till six weeks after the injury, when a prominence was noticed about the seventh dorsal vertebra. This gradually increased whilst he was in the hospital, until it formed a well marked elevation. For some time the patient remained in a very precarious state; his present condition, August 23rd, 1868, sixteen months after the accident, is as follows:

His general health is very good. The urine is rather offensive,

of acid reaction, and constantly dribbling away. The bladder is apparently small, as, on introducing a catheter, not more than one ounce of urine is removed. Bowels very costive. Sensation and motion absent in the left leg, both very slight in the right. Right leg, a little below the normal temperature, left, very much below. As a rule he eats and sleeps well, and his time is occupied in making various small articles, such as balls, models, etc.

This case is one where life might be prolonged and enjoyed for many years, as far as the spinal injury is concerned, if the patient's circumstances permitted of his obtaining the many luxuries which art has provided, in the way of water beds and other contrivances, for the permanently paralysed.

One or two points of special interest may be noted. 1st.—No spinal deformity appeared until six weeks after the injury. The fracture was probably of a comminuted nature, and coalescence eventually took place by the absorption or protrusion forwards of the separated portions of the body or bodies of the injured vertebræ. The spinal column now appears quite firm, permitting the patient to sit up in bed without support, and move the trunk freely. 2ndly.—The right lower extremity suffered much less than the other. There is a slight degree of both movement and sensation, and a corresponding approach in the temperature of the limb to that of the body generally.

To these cases may be added the following one, which came under the care of my colleague, Mr. Harrison.

A dock labourer, aged 42, was admitted into the hospital in December, 1867, in consequence of injuries sustained by falling down a ship's hold, a distance of some thirty feet. The right arm was completely paralysed, the corresponding leg partially so. There was less movement of the right side of the thorax than the left. Sensation on the right side was generally impaired. There was no priapism, and the patient had full control over the bladder and rectum. There was considerable fulness about the lower cervical region, and the spine of the sixth vertebra was out of the line, and diverted towards the left side. The patient was placed on a hair mattress, with the head level with the trunk, and supported by sandbags so as to prevent movement. The treatment was continued

for a month, when the patient became very restless, and it was quite impossible to continue it as long as it appeared desirable. The paralytic condition of the leg gradually passed away before the patient left the hospital, the arm, however, was very slow in showing signs of amendment. Under the influence of galvanism, friction, etc., its condition improved, until about seven weeks after the injury, when the patient was lost sight of, in consequence of being discharged from the hospital for very disorderly conduct.

From the condition of the spine previously described there is little doubt that fracture, or dislocation, or both, existed, but to such a limited extent as only to partially interfere with the functions of the cord. One side only being involved, the power over the bladder and rectum was not lost.

ON INCISION OF THE CERVIX UTERI,

By THOMAS SKINNER, M.D.,

ONE OF THE OBSTETRIC PHYSICIANS TO THE LIVERPOOL LYING-IN HOSPITAL AND DISPENSARY.

The operation of incising the cervix uteri is common to the impregnated and to the unimpregnated conditions of the womb. In the impregnated state it is limited to the time of parturition, and is only then employed for the purpose of facilitating unusually retarded labours, consequent upon occlusion of the os uteri, or of a rigid, unyielding state of the *os tincæ*, from cicatrices of ruptured parts, or of parts which have sloughed after previous hard labours, and such like morbid states. In the following remarks I shall limit myself to the operation in its relation to the unimpregnated uterus. And, first, of the operation itself.

A very great deal has been written and said as regards the operation, and, as a natural consequence, considerable difference of opinion has resulted, particularly as regards the *armamentarium* and the *modus operandi*. For my own part, I have no desire to differ from, much less to outshine others in the choice of instruments, and in the mode of operating; still, as I cannot follow all, I must take the course suggested by my own judgment, the result of a somewhat matured experience. In the first place, I shall content myself with enumerating the names of those who have distinguished themselves above others in this country by throwing light, *pro* or *con*, upon the operation, or upon the cases best suited to it. Foremost, we have Sir James Simpson, Bart., the late Dr. Rigby, Mr. Spencer Wells, Dr. Barnes, Dr. Greenhalgh, Dr. Routh, Dr. Savage, Dr. Protheroe Smith, Dr. Priestly, Dr. Marion Sims, Dr. Aveling, Dr. Oldham, Dr. Grailly Hewitt,

Dr. West, Dr. Henry Bennet, Mr. Baker Brown, and Dr. Coghlan.

For all practical purposes the operation admits of being divided into—

1. The minor operation.
2. The major operation.

And, so far as the different modes of procedure are concerned, we may speak of those who operate—

1. From without inwards, and
2. From within outwards.

The *minor* operation consists in the incisive dilatation of the cervical canal and *os tincæ*, whilst the *major* involves the incising of the *os internum* in addition to that of the *os tincæ*.

As regards either operation—they both admit of being performed from within outwards or from without inwards—each mode of procedure having its staunch and determined partisans. So far as I am concerned, when it is possible, and it is almost always possible, operating from within outwards is much to be preferred. The objection has been raised, that where a hysterotome will pass there can be no necessity for incision. The operation, be it remembered, is performed on account of dilatation failing to effect what is wanted, namely, a *permanent* patency of the cervical canal; and, if necessary, it follows that dilatation, so as to admit the passage of the hysterotome, is the primary step in the operation of incision of the cervix uteri. Those who operate from without inwards forget that the same objection which they urge against the hysterotome is equally valid against one of the blades of their scissors and of the ingenious little knife of Dr. Marion Sims. In the long run it comes to something like "six of the one and half a dozen of the other." It will generally be found, however, that in bad cases, cases really requiring incision, dilatation, in some form or other, is necessary.

Space will not permit, nor would it be profitable, to give a *resumé* of all the various instruments and modes of operating, therefore I shall limit myself to the instruments and mode of operating which I feel confident, with all deference to the distinguished Obste-

tricians who have preceded me, are as good as any and inferior to none.

Steps in the operation. — The primary step in either the major or minor operation is—1.—*Dilatation* may be done by metallic bougies, and by tents of laminaria or sponge. I never have had recourse to anything but silver or german silver probes and bougies. Dr. Marion Sims and others have laid great stress upon the pain, upon the difficulties and dangers attending dilatation of the cervix uteri, by means of metallic dilators. They have spoken and written about inflammation of the uterus and its appendages extending to the peritoneum, terminating sometimes in pelvic abscess and death, as not infrequent results of dilating by means of bougies. If those occurrences have happened, and I do not doubt they may have, they must be very great exceptions to the rule. I have dilated a considerable number of cervical canals, many where it was all but impossible to pass the finest surgeon's probe, and I am not aware that I have ever caused a patient anything like unbearable pain, and what little I have given them was but momentary, possibly a few seconds of a feeling of faintness, sickness, and the like. As to peritonitis, or any form of *itis*, I am glad to say that in my practice it has never followed dilatation of the cervix. If a surgeon's probe can be made to pass, I have never had any difficulty in dilating the cervix so as to allow a No. 12 male urethral bougie to pass, in about a week or a fortnight at most. The great secret in dilating the cervix is, never to attempt too much at one time, and never to attempt it at all if there is sub-acute or chronic metritis, or an irritable supersensitive condition of the cervical canal. The case is then not one of *simple obstructive* dysmenorrhœa, nor is it one of simple sterility from *mechanical* causes, the only two conditions relievable by the operation. As I do not wish to be misunderstood, let me observe that I am not advocating dilatation as preferable to, or safer than, incision of the cervix uteri; but, as dilatation must of necessity frequently be the primary step in the operation of incising the cervix, I am desirous of removing from the operation of dilatation what I believe to be exaggerated evils. Dilatation can never come up to, far less surpass or supersede, the operation of incision of the cervix uteri, for any purpose for

which permanent patency or enlargement of the cervical canal is required.

2. *Hysterotomy.*—Having succeeded in dilating the cervical canal to allow of the easy passage of a hysterotome, place the patient on her back in bed exposed to a good light. [I quite agree with Dr. Marion Sims, that, in all surgical operations where light is available, it ought always to be utilised.] Widen the limbs, and if thought necessary raise the knees, placing the feet on the bed. Introduce a Coxeter's bivalve speculum (one that will allow the hysterotome to pass easily to and fro), and open it, exposing the *os uteri*. Then introduce the bilateral hysterotome of Dr. Routh,* as manufactured by Coxeter of London, an outline engraving of which is attached to this article. If the *minor* operation is what is wanted, set the instrument at its fullest cutting depth; introduce the intra-uterine portion rather more than half way; hold the sheath and withdraw the handle. This will incise the vaginal portion of the cervix and *os tincæ*. If the *major* operation is wanted, set the instrument to its lowest cutting depth—introduce the intra-uterine portion to its full extent—hold the sheath and withdraw the handle. This will sufficiently freely incise the entire cervical canal. If the parts are hypertrophied, or larger than usual in those who have not borne children, the instrument may be set at its fullest cutting depth before operating. There is one point which in my estimation ought never to be lost sight of, and that is, whatever depth of incision is made, on no account ought the vaginal portion of the cervix to be *divided or split through and through*. In the operation from without inwards—particularly where it is accomplished by means of scissors—this "mutilation" must occur. With the hysterotome

* Of all the hysterotomes which I have seen, and I think I have seen and studied most of them, Dr. Routh's instrument, as made by Coxeter, is, *par excellence* the hysterotome for which I have a decided preference. I believe that it is founded upon the model of his colleague, Dr. Greenhalgh's hysterotome.

it may also occur, but it need not, and, I repeat, it *ought not* to occur;—because the capillary and venous circulations of the os and cervix are thereby mischievously interfered with, are obstructed by the division, and, as a consequence, there constantly result intractable forms of leucorrhœa, with chronic congestion and induration of the parts. I have had many such conditions to contend with, in cases which have come to me from the north and from the south. I have no hesitation in saying that, for any purpose whatever, *dividing* or *splitting* the cervix laterally is altogether an unnecessary part of the operation of *Incision* of the cervix uteri. The double incision having been accomplished by one stroke of the hysterotome, I introduce a piece of book muslin, about three inches square, on the point of a bougie or uterine sound. By doing so, hæmorrhage is entirely prevented, and the wound is kept from re-uniting. I renew this dressing every day for a week or so, and after the first few days I steep the muslin in an aqueous solution of carbolic and acetic acids. Before withdrawing the speculum after the first dressing, I fill it with loose cotton wool, and push it into the vagina as the speculum is being removed, by way of an additional preventive of hæmorrhage.*

After treatment.—The patient is to remain in bed until she is able to go about again, that is, as soon as the parts are healed, which is generally in about a week. About the end of this time, if there is no contra-indication, I pass a large sized uterine bougie daily, or every second day, for a week or fortnight, in order to prevent contraction of the cicatrising surfaces; and it is sometimes advisable to repeat this once a week in the interval between the first menstrual period and the next.

I have no hesitation in stating, that where the operation is performed as I have directed, and where the cases are properly selected, as well as the time for operating, namely, a few days after a menstrual period, I believe there is no danger from

* Many operators advise the introduction of sponge and other tents of *expansible* material; but they are objectionable, as their use is not without danger. I equally object to the use of all metallic or hard substances, in particular, intra-uterine spring tents and the like. They may be ingenious, but they are unsurgical, and much inferior to the muslin plug.

hæmorrhage, inflammation, or from a recurrence of the evil, more than may follow from the simple operation for fistula in ano. The not unusual practice of operating in consulting rooms cannot be too strongly condemned, as it brings the operation into unmerited disrepute, and is injurious to the patient by the hæmorrhages and inflammations which may, and which do take place in consequence.

Some operators, by way of keeping the parts from re-uniting are in the habit of touching the cut surfaces of the wound with nitrate of silver, or the like. I can only say that, as I have seen this practice followed by excruciating pain in very many instances, I cannot recommend it; and I have very little doubt that it is frequently followed by more than one form of "*itis*." The muslin plug is quite as effectual, is attended with no pain, and on the whole is a much more humane and surgical proceeding.

Uses of the operation.—The uses of the operation are said to be threefold. 1. To relieve or cure obstructive or mechanical dysmenorrhœa. 2. As a cure for sterility depending on mechanical or spasmodic stricture of one or more portions of the cervical canal. And 3. To remove certain displacements of the uterus, particularly retroversions and flexions of the organ, by increasing the chances of conception or impregnation.

As regards *the first* of these uses, I have always been sceptical. I have known the operation performed by the best operators, and with very indifferent success. Sometimes, if not always, the effect is but temporary; and I feel tolerably sure that even the temporary effect produced is much more likely to be the result of loss of blood at the time of the operation, or following it, than of the incisive dilatation of the uterine canal. I am the more inclined to be of this opinion, because I have had many of the worst forms of dysmenorrhœa under my care, cases which have been diagnosed, by the most distinguished incisers and dividers of the cervix, as obstructive, and cases which have been operated upon, some without the slightest benefit, and others with only temporary relief, and I have rarely failed to make a permanent cure of such cases by medical and hygienic means. One case of the kind was sent me by my friend, Dr. Turnbull, now of Exmouth,

and the words of his letter of introduction were, that he would "consider it a great triumph of professional skill if I succeeded in effecting a cure, after what had already been done."

This patient, who was suffering under the worst and most intense form of dysmenorrhœa I ever read of or witnessed; who, once in every month, *for years, writhed in agony*, each period ending with an entire day of coma and epileptic fits, arising from exhaustion following four days of excessive pain; and who was operated upon for mechanical or obstructive dysmenorrhœa without relief—was cured by medicine alone in the "Invalid Home" here, in the short space of six weeks. Judging from this and many other cases, I have long been of opinion that, as a means of relief or cure in dysmenorrhœa, incision of the cervix uteri ought to occupy no higher position than that of a *dernier ressort*.

In further elucidation of this part of my subject, let me just point to an observation which may be verified almost any day in private or hospital practice. Very frequently we find, when we would least expect it, the cervical canal and *os tincæ* small and contracted, and no pain whatever may be complained of during healthy menstruation; and we also as frequently find the same parts very patent, and accompanied with great pain during the catamenial period. The obstruction in *purely mechanical* dysmenorrhœa is not, in my opinion, referable so much to the narrowness of the canal of transit or exit, as it is to the consistency, the plasticity or liquidity of the fluids and solids to be transmitted. The pain accompanying the obstruction doubtless arises from mechanical incompatibility between the secretion and the canal of exit, *but this same incompatibility obtains where no stricture whatever exists*.

As regards *the second* of its uses, I have no hesitation in advocating and supporting incision of the cervix, both as regards its legitimacy and as regards its positive value. In sterility depending upon stricture, I am as certain that the obstruction is at the *os tincæ* and vaginal portion of the cervix uteri, as I am that in mechanical dysmenorrhœa the obstruction is at the *os internum*. In the latter case, however, as I have already said, the obstruction

is rarely caused by stricture, unless spasmodic (of the *os internum*); it is almost always caused by a plug of inspissated mucus, by the remains of a previous over active secretion (*Rigby*), by a clot or clots of blood, or from membranous or gelatinous exudations. In sterility again, the *os tincæ* is chiefly at fault—there is generally more or less elongation of the vaginal portion of the cervix, a tapering of it, and a small, perhaps pouting orifice. In sterility, the *minor* operation is in general all that is necessary; but, to prevent disappointment, the *major* had better be had recourse to.

I here beg to repeat, that *splitting up the vaginal portion*, and so "mutilating" it, is not necessarily a part of the operation of incision of the cervix for the cure of sterility, no more than it is for the cure of dysmenorrhœa.

The following case made so great an impression on my mind at the time, is otherwise so instructive, and, as it bears me out in the opinions I have formed and in the practice which I follow, I here transcribe it. In 1856, I asked Sir James Simpson to operate upon an artisan's wife, who attended his afternoon *clinique*, and who was very anxious to have a child. The *os tincæ* was small, the cervix elongated, and the canal curved, so as to make it impossible for either Sir James or myself to pass any instrument above one and a-half inches. The body of the uterus was natural, no way displaced—the woman was nine months married and perfectly regular. Sir James introduced his hysterotome as far as it would go, divided the parts in the usual way, and the result was, that, in *three weeks from the day of operation*, all the symptoms of pregnancy set in, and she bore a child at the full time. In this case, be it observed, the internal os could not be divided, showing plainly that the obstruction to impregnation, if there was any, was at the *os tincæ*, or in the curved state of the canal.

As regards *the third* use of the operation, that of rectifying displacements of the uterus by increasing the chances of conception, and thus obtaining a cure of the version or flexion by the evolution of the uterus during pregnancy, I must confess to being very sceptical indeed. It is in accordance with my experience

that retroflexion always returns after parturition, do what we like to prevent it. If it does not return, then, verily, it is more by good luck than good guidance. With retroversion there is a better chance. It is in my experience also that displacements of the womb *per se* are no great hindrance to conception ; but if a case of displaced uterus presented itself where the *os tincæ* was small, and the individual had been some time married and had never conceived or borne a child, then I should advise the *minor* operation, to favour conception, but I should not look for the removal of the displacement. If it should disappear, good and well; but, I repeat, it is not to be looked for. So that, after all, it comes to be only a cure for sterility with displacement. I had a case sent me from London lately, where the cervix was not only *incised*, but *divided*, for the cure of retroflexion by favouring impregnation. No good has followed, but, on the contrary, the poor creature has suffered ever since from chronic metritis and from the intractable form of leucorrhœa I have previously alluded to, which it will take months to remove. I repeat, that I have good reason to be very sceptical about this third use of the operation. I shall not condemn it altogether, however, but leave it an open question. It is just possible that a case might turn up where it would be advisable so to cure a displaced uterus.

Dangers and objections.—I have frequently been asked by my fellows in practice if I thought there was danger or risk to life or health in connection with the operation. I have no hesitation in saying that there is risk from hæmorrhage, from metritis, peritonitis, and every form of pelvic cellulitis, and, though last, not least, toxæmia. I have frequently seen all of these accidents but the last. I have only heard of the latter termination ;—but none of them have ever occurred in my practice. I attribute the absence of bad consequences in my own practice to care in the selection of cases, to choosing the proper time for operating, to the manner of operating which I adopt, and to the great care taken during the after treatment. In the selection of cases, above all things I avoid anæmic, dissipated, debilitated and emaciated subjects, as also gouty, rheumatic, and neuralgic habits. When these and other like conditions have been removed, there will

then as a rule be little necessity for the operation, except for the cure of sterility depending upon occlusion or stricture of the *os tincæ*, with or without flexion or curvature of the cervical canal, the chief legitimate uses of the operation of incision (not division) of the cervix uteri.

ACUTE TUBERCULAR PERITONITIS, SIMULATING MALIGNANT ABDOMINAL TUMOUR,

By I. DE ZOUCHE, M.D.,

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Anne J., aged 38, was admitted into the Liverpool Workhouse Hospital on the 10th August, 1867. She stated that she had always enjoyed good health until a month before her admission, when she noticed a swelling in the abdomen, which rapidly increased. She suffered no pain or inconvenience, further than slight discomfort from the size of the abdomen, until a few days previous to her coming into hospital, when her breathing began to be somewhat difficult, and she found herself unable to lie down in bed. On admission, the abdomen measured 45 inches in circumference. There was no œdema of the feet. The heart and lungs were healthy. There was no apparent alteration in the size of the liver or spleen. The face was pale, and, while far from wearing the expression of health, gave no indication of the amount of mischief going on in the abdomen. The digestive powers were good, and the bowels regular. The menstrual secretion had been regular until the *last* period, when it did not appear. The abdomen was equally distended throughout, and fluctuation of fluid, apparently in the peritoneal cavity, was easily perceived. There was dulness on percussion over the whole of the abdomen, except in the right lumbar region, in a very limited space. Nothing could at this time be ascertained by palpation, the fluid intervening at every part except the spot above indicated. The urine was diminished in quantity, cloudy, faintly acid, sp. gr. ·1022, containing no albumen. A few crystals of triple phosphate were seen under the microscope, but no other peculiar appearance. The cause of the ascites was the more obscure as there was no

family history of disease to guide in its determination. About the 18th August, she commenced to vomit her food. This vomiting it was found impossible to check. She took food readily, even eagerly, although quite aware that she could not retain it. Quantities of yellowish muco-bilious matter were also frequently vomited. A great many remedies were tried to arrest this condition, but in vain. She suffered greatly from thirst. I remarked that the quantity of fluid vomited was much greater than that taken by the mouth. At the same time, the size of the abdomen decreased rapidly, and the outlines of what appeared to be a tumour could be felt. It appeared to consist of three parts, giving the idea of a semisolid multilocular tumour, the largest portion occupying the left iliac and lumbar regions. There was much pain complained of on pressure being made over this situation. Shortly before death, the circumference of the abdomen was a little less than the normal measurement, and fluctuation was scarcely perceptible. The bowels were inclined to be constipated, but were acted on from time to time by aperients and enemata. Three days before death there was a natural evacuation. The patient became much emaciated and depressed from want of food and sleep. She dozed under the influence of opiates, subcutaneously injected, but was frequently awakened by the necessity of vomiting. She died on the 3rd September.

Examination of the body thirty-six hours after death. There was evidence of recent pleuritis at the lower and posterior part of the chest, with serous and bloody effusion into the pleural cavities. The heart was healthy, but displaced upwards, and toward the mesial line. On opening the abdomen, what at first sight appeared to be a tumor came into view, occupying a great part of its cavity. It was found to consist of the omentum perfectly infiltrated with tuberculous matter, and thickened to the extent of half an inch. The stomach and intestines were matted together by this tuberculous mass, and were themselves studded with tubercle, which, however, was deposited on their peritoneal coats, but did not extend to their interior. The tuberculous inflammation appeared to have been most intense and recent in the left iliac region, where pain on pressure had been complained of. There was no tubercle in

the lungs. The liver was slightly fatty, the spleen and kidneys healthy. A small quantity of fluid was found in the peritoneal cavity.

This case has many points of interest; first as to the diagnosis. This was surrounded with difficulties. It was believed that a malignant tumour existed, but its precise nature or position remained undetermined. The lobulated and uneven feel of the intestinal mass, covered by the thickened omentum, giving a dull sound on percussion over the umbilical and hypogastric regions, and, taken in connection with the ascites, seemed to indicate the existence of an ovarian tumour. The age and appearance of the patient, and the suppression of the menstrual secretion at the last "period," would confirm this belief, and the vomiting might be accounted for as the result of reflex irritation. Against this supposition were the facts that the os uteri appeared healthy and in its normal position, and that affections of the ovary seldom run such an acute course. Although tuberculous inflammations are not usually classed among the malignant affections, yet this had all the symptoms of malignancy in rapidity of course and exhaustion of the patient.

Another interesting phenomenon was the absorption of the ascitic fluid by the abdominal vessels, and its being emptied out by the stomach. This absorption must have taken place constantly, as the vomiting had no relation in point of time to the taking of food. It appeared as if it required a certain quantity of fluid to excite the stomach, which rejected it as soon as it had accumulated.

ON MEDICAL OPHTHALMOSCOPY, IN ESPECIAL RELATION TO CASES OF PROGRESSIVE GENERAL PARALYSIS,

By T. R. GLYNN, M.B. Lond.,

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The ophthalmoscope seems to have been discovered some years before any one imagined that it might give information other than such as could be valuable to the ophthalmic surgeon, or thought of using it in the investigation of diseases of the brain or spinal cord.

If fewer difficulties had attended the application of this instrument, it is probable that the physician would have at once looked upon it as a valuable clinical aid, or at least would have been more eager to give it a fuller trial.

Physicians, in investigating some cases of intracranial disease, have endeavoured to gain some information as to the state of the cerebral circulation by applying the stethescope over the cranial sinuses; now, however, that they have the ophthalmoscope to assist them, they have no occasion to resort to expedients so nearly fruitless.

The wonderful sympathies that exist between the intracranial and intraocular circulation, and between the nutrition of certain parts of the brain and cord and that of the optic disk, are in many cases calculated to help those who study diseases of the cerebrospinal centres with the mirror in their hands.

Professor A. Von. Graefe seems to have been one of the first who took a wider view of the revelations of the ophthalmoscope.

He, in the year 1860, communicated to the Biological Society of Paris the result of his investigations "concerning certain changes of the retina and optic disk, observed in connection with different cerebral affections."

In the same year, Dr. Ogle also published some observations "on the use of the ophthalmoscope as a help to diagnosis in diseases of the nervous system."

These observers were soon followed by others. MM. Liebreich, Buchut, Lancreaux and Galezowski abroad, and Drs. Albut, Hughlings Jackson, and others at home.

Physicians now seem to take much more interest in the revelations of the ophthalmoscope. The papers on medical ophthalmoscopy that appear from time to time in this country, and on the continent, contain much that is worthy of the attention of the pathologist and medical practitioner.

Not only have changes in the depths of the eye been discovered, which are symptomatic of various cerebral and spinal affections, such as meningitis, encephalitis, hydrocephalus, intracranial tumours, and locomotor ataxy, but others peculiar to more general disorders, as Bright's disease, diabetes, and ague, have been noted.

It is not surprising that psychological physicians should have early essayed to examine the retina of their patients. Dr. Coccius of Leipsic was the first who thus used the ophthalmoscope (*Archives Générals de Medicine*, September, 1866).

Dr. G. Ludwig also examined the eyes of a great number of insane persons. He seems to have only found a passing fulness of the vessels of the retina and disk in one or two instances. In one case he states that he could predict the onset of a paroxysm of mania, by the capillary injection of the disk which preceded it (*Allgemeine Zeitschrift für Psychiatrie*, xiii. i. 1856).

Dr. H. Wendt examined the eyes of 150 of the patients at the *Asile de Halles*. "Unfortunately, however, his attempt was attended by little success. Several times he found slight irregularities of the borders of the optic disk. On another occasion, part of the edge of the papilla was clearly defined by a line of pigment.

He observed partial excavations of the disk thirteen times in one eye and twenty-nine times in both.

In one patient he discovered a fulness of the retinal veins. In about thirty instances he found a sclero-choroiditis" (*Buchut du Diagnosis des Maladies du Système Nerveux*).

"Dr. Gualiemo, professor of ophthalmology at Pavia, examined many monomaniacs and others suffering from the more tranquil forms of insanity, and discovered in fifteen cases great dilatation of the veins of the retina" (*Buchut*). Buchut records a singular and instructive case which occurred in the practice of Dr. Baumler of Erlangen.

A man, fifty years of age, was suffering from suicidal mania. An ophthalmoscopic examination of his eyes was made. In one eye there was a small apoplexy of the retina, together with an atheromatous degeneration of some of the arteries; one of these vessels was quite white throughout its length. On the man's death, by suicide, softening of the brain was revealed.

M. Liebreich has endeavoured to prove that there is "a predisposition to retinitis pigmentosa, in the cases of idiots, and especially of deaf mutes who are the children of consanguineous parents."

"Out of 341 deaf mutes at Berlin, 241 were examined by the ophthalmoscope. There was pigmentation of the retina in 14; a considerable number, since, according to the researches of Liebreich, there are probably only from 20 to 30 persons suffering from this disease in the whole town. Out of these 14 deaf mutes, 8 were Jews; now we know that consanguineous marriages are frequent among the Jews. In 5 cases out of the 14 the parents were found to be related to each other; in 7 they were not; in 2 information was wanting. In the asylum for the deaf and dumb at Paris, Liebreich found 7 cases of retinitis pigmentosa, 3 of these were the children of parents who were consanguineous" (*Fano Traité Pratique des Maladies des Yeux*, tome 2, p. 453).

These observations do not appear to have been confirmed by subsequent observers. M. Duguet examined 80 idiots at the Salpêtrière, but found only pigmentation of the retina in one case.

Observers have long sought for some lesions in the fundus of

the eye, characteristic of progressive general paralysis. Buchut remarks, "General paralysis, with or without mental alienation, exerts often an evil influence upon the visual function, in such a way as to disorder either the movements or the nutrition of the eye."

"Though not actually characteristic of the disorder, these lesions may aid diagnosis considerably, and merit careful study. They are:—nystagmus, this lesion is rare but has been observed by several authors; strabismus and diplopia, they exist often at the commencement of general paralysis and a long time before the appearance of other symptoms of paralysis or insanity; amaurosis, this is stated to be quite exceptional by Georget, Parchappe, Billod, &c., but I have observed one example of it; inequality of the pupils observed by Baillarger, Lasègue, Billod, in one-third of their cases; and lastly, that lesion which I call ataxy papillaire, or trembling of the papilla." Buchut then goes on to state, that he has observed this symptom in many patients under his care. When it exists these are its characters: "there is an abnormal and irregular mobility of the eyes, so that they are carried sometimes in one direction and sometimes in another, not being quite under the control of the will. To fix the eye is impossible, or almost so. There is in the muscles a hesitation in action which resembles the trembling of the tongue." Buchut finally alludes to atrophy of the disk, but says that it is rare. He records two cases in which he observed it. M. Calmeil examined 56 cases of general paralysis. He found in 3 complete amaurosis. In a few only, impairment of sight, sometimes of one eye, sometimes of another, and sometimes of both. "Usually the weakness of sight occurred during the last stage of the disease."

Galezowski examined many patients at the Salpêtrière suffering from general paralysis. When the sight was affected or lost, he invariably found progressive atrophy of the papilla. Other observers, too, have occasionally discovered the same affection.

Defect of vision and alterations in the fundus are far from being of frequent occurrence during the progress of general paralysis, yet the pathological changes of the brain in this disease are very extensive and constant.

M. Linas opened 114 bodies of paralytic insane, and in every case he found decided signs of disease, in the brain or its membranes. "In 12 cases he found the pia mater excessively injected. The cerebral substance was quite full of blood, the grey matter being from an intense red to a dark violet. In 28 cases, besides the preceding alterations, there were adhesions between the convolutions and the meninges. In 74 cases, the meninges were infiltrated, opaque, and as tough as a fibrous membrane, the cortical substance of the brain, sometimes violet, sometimes yellowish, according to the degree of the paralysis, always softened, less thick than in normal brains; the white substance injected, and sometimes infiltrated; the convolutions meagre, and the whole mass of the brain more or less atrophied."

According to Griesinger. "The changes most frequently observed in general paralysis are great œdema of the membranes, adhesion of the pia mater to the cerebral surface, greyish red softening, or coloration, and partial superficial induration of the cortical substance, with increase of connective tissue and destruction of the nervous elements."

"Atrophy of the whole brain, or especially of the convolutions, is very common."

"An increase of cellular tissue, and development of true connective tissue, occurs frequently in the white substance, either generally diffused or limited to certain portions. Pachymeningitic processes, meningeal apoplexy, degeneration of the cerebral arteries, are common."

"The anatomical changes are not always identical, but constantly present certain varieties; this appears to depend upon the fact, that in some cases one, and in other cases another, element of the disease is the most prominent (it may be meningitis, or atrophy of the entire brain, or sclerosis of the cortical substance); and this may depend upon the more rapid or more acute course of the disease."

How is it that we have not more constant and characteristic lesions in the fundus of the eye in cases of general paralysis?

Before pursuing this question further, we had better consider

under what circumstances, and in what diseases, we find the most decided morbid appearances in the eye. There is one important anatomical fact, which is at the foundation of much of the pathology of the affections of the disk and retina.

In the fundus of the eye we see two distinct systems of vessels, one the central artery and vein of the retina, and the other the small vessels which give the rose colour to the disk. It was Galezowski who first directed attention to this fact (*Etude Ophthalmiscopique sur les Alterations du Nerf Optique*).

The central artery is a branch of the ophthalmic artery. The central vein terminates in the ophthalmic vein, and so pours its blood into the cavernous sinus. The optic nerve, of which the disk may be considered the peripheral termination, is supplied by several arterial branches, namely, a branch from the middle cerebral artery to the optic tract. One or two small vessels from the choroid plexus which also enter the optic tract; some small branches from the pia mater to the chiasma. There is also a special artery to the corpora quadregemina *(testes)*. Besides this the pia mater invests the optic tract as it does the brain. Thus, as Galezowski observes, "these capillary branches form a vascular network from the optic tracts to the papilla of the optic nerve."

This independence of the retinal and papillary circulation is verified by pathological observation, and in no instance more strikingly than in embolism of the central artery of the retina. In such cases, while the central vessels are bloodless, or nearly so, the papilla is of its natural hue, at all events till it becomes secondarily implicated. Many examples of this affection have been recorded. Dr. Fano (Observation cclxiv.) relates a well marked instance of it.

If there be any impediment to the free circulation of the blood in the cavernous sinus, there will necessarily be a stagnation of the blood in the central retinal vein. The branches of this vein may then become distended, tortuous, or varicose; if the obstruction be great, blood may be effused on the retina. The papilla cannot escape if there be much distention, for, as Graefe and Dr. Albut have shown, the central vein then exerts a baneful

eccentric pressure on its nervous elements and vessels as they are surrounded by the unyielding sclerotic ring, a state of strangulation is thus produced, and this Dr. Albut calls ischœmia of the disk.

Inflammation of the meninges at the base of the brain, if it implicates the walls of the cavernous sinus, causing deposition of lymph in its interior, and consequently impeding the circulation, may thus give rise to these conditions. The same lesions may also be produced by the direct pressure of an intra-cranial tumour, etc., etc.

A meningitis, if in the neighbourhood of the optic nerves, may excite in them an inflammation from an extension inwards of the morbid action, and this may pass down the nerve to the papilla, constituting what is called a descending neuritis.

The inflammation around a clot, if in the vicinity of the optic nerves, may also readily excite a neuritis, or the pressure of a tumour may do the same.

It is the site of the intra-cranial lesion which determines to a great extent the position and character of that in the back of the eye. If an obstacle to the return of the venous blood from the eye be produced in either of the ways before mentioned, a dilatation of the central vein and its branches is the first step of the morbid process. The disk, if implicated, becomes so secondarily.

If an inflammation be excited in any part of the optic nerve, an optic neuritis will be probably produced; and here necessarily the morbid action in the fundus commences in the papilla. The inflammatory swelling of the papilla may impede the circulation in the retinal vessels, so that they, in their turn, may be secondarily affected.

Diseases of the spinal cord, such as chronic myelitis, especially when occurring in the dorsal region, and locomotor ataxy are not infrequently attended with hyperæmia and atrophy of the optic disks. Some observers, as Buchut, believe that the disease of the cord may influence the state of the vessels in the back of the eye, through the communication that exists between the anterior roots of the two first dorsal pairs and the sympathetic;

others, as Galezowski, think that the sympathetic affection of the disk depends on the intimate connection that exists between the posterior and antero-lateral columns of the cord, and the corpora quadragemina.

Writers on cerebral ophthalmoscopy often make mention of atrophy of the disk. Two distinct kinds of atrophy are recognised: one is the result of impaired nutrition of the optic disk, brought about by a neuritis or an ischœmia; the other arises from a starving of the papilla from the gradual dwindling of the vessels of the optic nerve. The former variety is far the most common. The ophthalmoscopic appearances of both are characteristic.

In consecutive atrophy, there are traces of past morbid action in the disk. It is not as white so it is in primary atrophy, but looks stained and patchy. Its borders are irregular and concealed in places by old exudation.

In progressive or primary atrophy, the disk is of a glistening, pearly whiteness. It is regular in form, and its borders are clearly defined.

We will now return to the question; How is it that defect of sight, and alterations of the papilla and retina, are not more frequent attendants on general paralysis? If the cerebral lesion is not in the neighbourhood of the optic centres, or nerves, or near the cavernous sinus, it is improbable that they can become in any way implicated, and, therefore, that the nutrition of the retina and disk can be influenced. There are no visible alterations in the fundus in simple inflammation of the membranes on the superior surface of the brain, but in meningitis at the base they are very frequent. Thus, changes in the back of the eye seldom occur in the meningitis that may ensue during an attack of acute rheumatism, or of scarlet or other fevers; but they are very common in tubercular meningitis. When, as in some cases of general paralysis, and in many cases of chronic insanity, the diseased action is limited to the cortical substance of the upper part of the cerebrum, and the adjoining pia mater, we should not expect to find anything abnormal by the ophthalmoscope. When, however, the medullary substance is greatly involved, as it often

is in other cases, it appears strange that no signs of cerebral disease should be apparent in the eye.

This exemption from disease is probably explained by the geographical position of the optic centres and nerves, and by their independent vascularisation.

When in cases of general paralysis any lesion is apparent in the fundus, it is said usually to be a primary atrophy of the disk, may there not sometimes be a chronic inflammation of the disk of a similar character to that of the brain, produced by a descent of the morbid changes ?

It must be remembered that there is in each cerebral hemisphere a fan-shaped expansion from the optic tracts to the posterior lobes. Now, as disease is sometimes traced as far as the spinal cord, may it not occasionally descend to the optic nerves through these continuous fibres ?

Is it not probable that we should occasionally find a primary atrophy of the disk in those cases where there is atrophy of the brain attended with sclerosis, and general disease of the cerebral arteries ?

Through the kindness of Dr. Rogers, the Physician to the Rainhill County Asylum, Dr. Roberts and I were, in the month of July last, permitted to examine the eyes of such of the patients in the Institution as we desired. We are very much obliged to Dr. Rogers for the opportunity afforded to us, as well as for his valuable co-operation. We have to thank Mr. Stocks and Dr. Barker, the Assistant Medical Officers to the Asylum, for their kindness in supplying the notes on the cases.

There are about 500 patients in the asylum, and among these a great number of cases of general paralysis. We, however, could find no instances of amaurosis, and very few of decided impairment of vision.

The two most marked cases of defective sight were caused by affections of the eye, probably quite independent of the cerebral disease. One was a case of cataract, and the other of opacity of the cornea.

In several instances we found on using test types, that the acuteness of vision was to some extent impaired.

In some cases of general paralysis, where we used the ophthalmoscope, we experienced some difficulty in examining the disk, from an inability of the patients to maintain their eyes long in one position. This is the symptom that Buchut calls "trembling of the papilla." One or twice we found an inequality of the pupils.

We first examined the eyes of eight cases of progressive general paralysis, of various degrees of intensity. In all cases, the pupils were dilated by atropine. There were some marked peculiarities in the eyes of three of these cases.

George V., aged 46, admitted June, 1868. Note on admission—"Progressive general paralysis, with general failing of his mental faculties, no delirium — muscular system very low, soft and flabby."

5 Type Jäger is the smallest he can read.

Ophthalmoscopic appearances:—

Left eye.—Retina natural; margin of disk well defined, but decidedly irregular, a little pigment on outer side; colour natural. Central vessels natural.

Right eye.—Margin of disk also irregular.

William H., aged 46, admitted May, 1867. Note on admission—"Progressive general paralysis with dementia. Muscular development good."

While in the asylum has had several short attacks of paralysis, each of which has left him more helpless in mind and body.

5 Type Jäger is the smallest he can read.

Right eye.—Disk, appears swollen, much more red than natural. Margin ill defined and cloudy. Central veins enlarged and rather tortuous, arteries natural.

Left eye.—Ditto, but not so well marked.

Garret S., aged 25, admitted August, 1867. Note on admission—"General paralysis with dementia. Has been laid up six months. Bodily condition good superficially. Is very nervous, and excessively depressed. No delusions. Complains of his head. Cannot articulate or speak plainly."

During his residence in the asylum has become very much weaker, both in mind and body. Muscular system not so well nourished. Has paroxysms of excitement.

Unable to test the sight, as can get no satisfactory answer from him.

Left eye.—Disk ill defined on its inner side, where it also appears congested. Central arteries and veins natural.

Right eye.—Natural.

I have not included the following case with the above, as an example of a change in the eye symptomatic of disease of the brain, as the affection of the eye was probably purely local.

Henry P., aged 43, admitted March, 1867. Note on admission—"General paralysis. Melancholia. Muscular system soft and flabby. Has several delusions."

During his stay in the asylum, has improved both in mind and body. Muscular system much healthier and firmer. Has no delusions now. "Believes his short-sightedness came on from over-work at his watchmaking trade."

He has a partial opacity of the cornea of the right eye, with a cataractous lens.

He says that he underwent an operation before his admission. What the nature of the operation was is not clear.

There was commencing cataract of the lens of the left eye.

The tension of the eye-balls seemed normal. The disk in the left eye appeared more red than natural, and was ill defined. Veins very full. Arteries healthy.

I scarcely know whether we ought to consider the irregular outline which the disks presented in the case of George V., an individual peculiarity or a pathological sign.

The centre of the papilla was slightly depressed, but only normally so, and was of its natural white colour. The border presented the usual half tones of red and white.

This condition certainly had not been preceded by any neuritis; it was not a commencing "consecutive atrophy;" there was no blearing nor staining of the disk, nor no exudation about its borders. Neither was the change in the disk such as we should find in a primary atrophy, for then the disk maintains its normal form and outline, but gradually whitens from its periphery inwards.

The man could only read 5 Jäger, but this diminution of the acuteness of vision might have been due to some error of refraction.

On the other hand, however, we might not be wrong if we regarded this alteration in the contour of the papilla, and this impairment of vision, as signs of commencing chronic inflammation of the optic nerves (what Albut would call chronic neuritis), attended with a sclerosis of the intercellular tissue, and very little vascular action. Repeated observation alone will enable us to form a correct opinion.

On examining William H., we discovered a somewhat intense congestion of both disks, especially of that of the right eye. An interesting proof of the swelling of the disk deserves to be noticed. It was easy to see that the veins as they crossed the disk were pressed upon, for on its face they appeared smaller and lighter in colour, but just beyond its border they seemed to be dilated and tortuous. There can be little doubt, I think, that this hyperæmia of the disk was not a passive congestion, due to a stasis of the venous blood from some impediment to the circulation in the cavernous sinus. That it was not the commencement of what Dr. Albut calls an ischœmia of the disk. Though the retinal veins were dilated they did not appear enlarged to such a degree as to exert any mischievous eccentric pressure on the disk.

The congestion was then probably active. If so, was it the forerunner of an acute inflammation of the optic nerve? It might have been, but it is unlikely. It is more probable that it was the commencement of some more chronic inflammation.

In the patient, Garret S., there was a marked congestion of the inner side of the optic disk of the left eye. Perhaps this was an earlier stage of a pathological condition, similar to that existing in the case of William H.

The following are the cases in which the ophthalmoscope revealed nothing abnormal.

Mary P., aged 31. Progressive general paralysis and dementia. Muscular condition fair; mind feeble. Has a tendency to clip her words when speaking, but neither is her tongue, nor are the muscles about her mouth, tremulous. Reads all the type easily.

Both disks are somewhat anæmic, and there is a little pigment around one border.

Margaret H., aged 36. General paralysis. Has been ill about two years. Note on admission—"She is very incoherent, and has many delusions. She staggers in walking. Clips her words when speaking. Has a tremulous tongue. Nutritive condition good." Since admission has become much more feeble. She has had one or two exacerbations. Reads all type easily. Fundus healthy in both eyes.

James B., aged 42. General paralysis. Ill two and a half years. Has various delusions about his property and wealth. Appears tolerably robust. Since his admission he has had several exacerbations. Muscular condition much weakened. 7 Type Jäger is the smallest he can read, but there are superficial opacities of both corneæ. Fundus of both eyes healthy.

James M., aged 31, admitted June, 1868. General paralysis and dementia. Has been ill some time. His mind is very defective. No particular delusions. Good muscular condition, superficially. Has continued much in the same state since his admission, both as regards his mental and physical condition. He says that 13 type, Jäger, is the smallest he can read. Fundus of both eyes natural. It was strange that the acuteness of vision should be so impaired in this instance, but the man may have deceived us as to his powers of sight.

Thus we were quite unable to find any examples of atrophy of the disk.

I think we are justified in believing that in those cases where morbid changes were apparent in the disk, there was very general disease of the brain, that it was descending to the base of the brain, and that the white substance was very deeply implicated.

We then examined several epileptics, and one or two cases of mania.

The two following cases of epilepsy were the only ones in which we observed anything at all abnormal.

William T., aged 50, admitted in 1861. General condition good. He has an epileptic fit about every three weeks. He is incoherent for a long time after a fit, and runs about in an excited

manner. His mind is gradually becoming weaker. 11 Type is the smallest he can read. Both disks are more red than natural, and their margins are ill defined. Central veins somewhat full.

Elizabeth W., aged 41. She has had fits for two years and a half; there is an interval of about a month between each. Her mind is feeble. She has complained of imperfect vision for more than two years.

She reads all but 1 type.

Left eye.—Disk very much more red than natural. A little pigment on its inner side, and also scattered over the retina. Central veins distended.

Right eye.—Disk the same as in the left eye. The veins, if anything, fuller.

One of the patients we examined, who was suffering from mania, had a partial ptosis of one eyelid. There was nothing abnormal in either fundus.

During a paroxysm of epilepsy, there is no doubt great congestion of the brain and retina.

Buchut observes, "After an attack of epilepsy, there is always some dilatation of the retinal veins, which gradually diminishes."

"In epilepsy we often find atrophy of the choroid, retinitis pigmentosa, maceration of pigment, and exudations and hæmorrhages upon the retina, which evidently depend on this disease."

"In the interval of the attacks of essential epilepsy, there is no alteration of the disk, nor of the retinal vessels."

"In symptomatic epilepsies, we nearly always find, on using the ophthalmoscope, serous infiltration and atrophy of the papilla."

Why this condition of the papilla should exist so frequently in cases of symptomatic epilepsy is not at all apparent.

If the epilepsy be symptomatic of some lesion at the base of the brain, and near the optic centres or nerves, we should certainly expect to find some marked affection, a neuritis, for instance, of one or both disks.

There can be no doubt that the ophthalmoscope may at times afford valuable aid to the physician in determining the existence of cerebral disease, as well as assist him in judging of the position of

an intracranial lesion. Its greatest merit, however, undoubtedly is this, that it enables him to follow the steps of certain morbid processes occurring in nervous tissues. It has given to the following oft-quoted words of Dr. Latham a far wider application.

"Here you see almost all diseases in miniature: and, from the peculiar structure of the eye, you see them as through a glass: and you learn many of the little wonderful details in the nature of morbid processes, which, but for the observation of them in the eye, would not have been known at all."

ON POISONING BY STRYCHNIA,

By CHAUNCEY PUZEY, L.R.C.P. Lond.,

HOUSE-SURGEON TO THE ROYAL INFIRMARY.

On Tuesday, February 18th, 1868, at 2 a.m., a young man, about 24 years of age, was brought to the Liverpool Royal Infirmary, suffering from acute tetanic symptoms, said to be the result of poisoning by strychnia.

He stated that, *a little before* 12 *o'clock, midnight*, he had swallowed sixpennyworth of "Hunter's Vermin Powder," spread on bread. He had been drinking rather freely at the time. *In about half an hour* afterwards, after he had gone to bed, he was aroused by a peculiar sensation of stiffness about the toes, "and a cold shudder ran up his legs." He then tried to get out of bed, but was unable to do so. In a minute or two after, cramps came on in his legs and arms, and he felt a suffocating sensation in his throat. After this he thought he became unconscious for a few minutes, and then found himself sweating profusely. In about a quarter of an hour after, he vomited a little, and threw up (he thinks) some of the poisoned bread. His friends at this time found him, and sent for a surgeon, who gave him an emetic, and ordered him to be sent to the Infirmary. At that time he was suffering severely. He vomited as he was coming in the cab.

On admission, at 2 a.m., he was cold, with feeble rapid pulse, face congested, and skin clammy; breathing short and hurried. At intervals of every three or four minutes, a spasm came on, in the form of well marked *opisthotonos*. During the spasms the respiration became hissing, jaws fixed, eyes very prominent, face congested and livid, and the man appeared as if he would die of asphyxia.

Each spasm lasted not quite two minutes, then there was about two minutes interval, during which intervals the man was quite conscious, and described his sensations after taking the poison. Thirty minutes after admission he vomited again. (In the vomited matter, a trace of strychnia was found.) The act of vomiting was accompanied by great pain, and was of a peculiar spasmodic, jerking character. He could swallow nothing, so it was determined to try subcutaneous injection. At 2-30 a.m., one third of a grain of morphia was injected into the calf of one leg. The introduction of the needle brought on a violent spasm, but in five minutes the man expressed himself as being easier than he had been for the last two hours, and the attacks became less frequent and less severe. About 3-15 they began to increase again, and a third of a grain of morphia was injected into the other leg, with renewed benefit. Shortly before this, the patient seemed so exhausted, and the pulse so feeble,—in fact, hardly perceptible during the spasm,—that small quantities of brandy and water were frequently given, at first with considerable difficulty.

At 5-30 a.m. he had been dozing a little, and the spasms had been much less violent, but they appeared to be returning a little more frequently. Their character was, however, much altered, as they came on with sudden jerks that nearly threw the patient out of bed, causing him sudden acute pain, but unattended by trismus. A quarter of a grain of morphia was injected, and the brandy stopped, as his skin was much warmer, and pulse better.

At 7 a.m. he was again seen, and was so much better that nothing further in the way of treatment was thought necessary; but every now and then a sudden jerking spasm would seize him. These gradually became less violent, and by the afternoon had altogether ceased. He suffered from considerable pain and tenderness for several days afterwards, and slight ecchymoses appeared about the legs and arms, where the spasms had been most severe.

He went out quite well in less than a week.

It appears to me that there are two or three points in this case worthy of notice.

There seems to be no doubt that the man swallowed the whole powder. Mr. J. C. Brown, B. Sc., the lecturer on Chemistry and Toxicology at the Infirmary School of Medicine, analysed a similar powder for me, and found that it contained exactly *three grains of strychnia.* (This, according to Taylor, is usually a rapidly fatal dose). He vomited a little about an hour after taking the poison, but it must have been nearly two hours before the contents of his stomach were evacuated, for the emetic given him by the surgeon who was called to see him did not take effect until he was being brought in a cab to the Infirmary, at 2 a.m.

But after this a considerable quantity of strychnia remained in his stomach, for at 2-30 he vomited again, and in a small quantity of the vomited matter, collected and analysed by Mr. Brown, there was found $\frac{1}{10}$ of a grain.

It appears probable that the absorption of the poison had been retarded to a certain extent by the state of the man's stomach, he having been drinking spirits freely that night, and that to this fact he owed his escape from speedy death within an hour.

As regards the treatment adopted, it consisted of three things—

1st, An emetic to remove the poison remaining in the stomach;

2nd, The injection of morphia, to put a stop to the convulsions, the result of the poison already absorbed; and

3rd, Stimulants, to overcome the exhaustion due to the spasms.

Neither the first nor the second part of the treatment would *per se* have been sufficient. Of course, it would have been unreasonable to trust to the morphia whilst any poison might still be in the stomach; and it was evident to bystanders that the emetic alone would not have saved the man's life, as he must almost certainly have died from exhaustion if the tetanic symptoms could not have been relieved, and his strength at the same time supported; and in no way could this so soon be effected as by the hypodermic method.

Probably many would suggest that the administration of chloroform would have succeeded as well. But, in the first place, it appeared to me that it would be difficult to combine this with the administration of stimulants and support to the patient; and

again, I thought it a less safe method of treatment. For it seemed so likely that the man would die, during, or immediately after one of the convulsions, that I was fearful, lest, supposing such a thing occurred whilst he was inhaling chloroform, death might be attributed to *it*. In the *Medical Times and Gazette* of May 9th, of this year, and in that of the 27th of June, 1867, cases of recovery after strychnine poisoning are related where chloroform was found to act in the most satisfactory manner. But even supposing each mode of treatment to be equally safe, there can be no doubt, I think, which is the more convenient, where there is not a staff of assistants to relieve each other in the administration of the remedy.

The effect of the hypodermic injection was manifest almost immediately. In five minutes the patient expressed himself as being easier than he had been for two hours before, and in half an hour he was able to swallow frequently small quantities of brandy, without which it appeared likely that he would sink from exhaustion. To the necessity for the administration of stimulants in such cases, Mr. Phelps draws attention in his observations on one which he treated at the Northern Hospital in this town, five years ago, and which is the second of those I alluded to above. In his case, beef tea and brandy were injected into the stomach whilst the patient was under the influence of chloroform.

The effect of the morphia was only temporary, for the injection had to be repeated in three-quarters of an hour, and again in two hours more.

The change in the character of the symptoms, as the effects of the poison were passing off, was peculiar, the violent tetanic spasms gradually becoming weaker and weaker, and then being replaced by sudden short jerks or starts of apparently every muscle, occurring at uncertain intervals, and calling to the mind of the observer the slight and interrupted shocks given off by an electro-galvanic machine after it has been worked for a considerable time.

CASE OF INVERSION OF THE UTERUS,

By JAMES HAKES, M.R.C.S.,

SURGEON TO THE LIVERPOOL ROYAL INFIRMARY.

Inversion of the uterus is an accident of so distressing and serious a nature as to deserve the attention of every medical man; and any safe and effectual means of reducing the inversion, when it has become chronic, will no doubt be welcomed by the profession, especially if easy of application, and productive of but little suffering to the patient.

It is scarcely possible, I think, to imagine any remedy with a more just claim to such a character than that which proved successful in the following case; and it is on this account that, notwithstanding the many imperfections in its history, I hope it may be considered deserving of a place in the *Liverpool Medical and Surgical Reports.*

It is perhaps impossible to say after what lapse of time attempts to reduce inversion of the uterus should be considered hopeless. Dr. Churchill refers to cases of success where this condition had existed for many months. The case I proceed to describe will give additional encouragement to any one who may have to treat this complaint.

Mrs. T., admitted into the Thornton ward of the Liverpool Royal Infirmary, July 30th, 1867. Age, 23. Married. Thoroughly exsanguine, and presenting all the symptoms usually following loss of blood.

She was confined of her first child March 4th, 1867. The particulars that follow were obtained from herself and her mother. She had a good labour, and only a moderate flow of blood accompanied the expulsion of the placenta. She went on

well afterwards, the lochia being rather scanty. At the end of three weeks she sat up. Two or three days after this, the red discharge returned, and, on the thirty-first of March, flooding occurred to such an extent as to make her faint. The doctor that came to see her introduced his hand and arm into the vagina, and brought away an immense amount of clotted blood; gave her a great deal of pain, and she felt a peculiar and disagreeable turning in her right side. From that time till her admission into the Infirmary, and for some weeks after this, she was never free from sanguineous discharge to a greater or less extent, nor without severe pain in the stomach and back.

She was first examined by Mr. Puzey, and afterwards by myself and others, and the following facts were noted.

The perinæum very narrow, owing to laceration at the time of labour. Vagina roomy, relaxed, and very moist. It was occupied by a tumour, reaching almost to the external parts, nearly cylindrical in shape, and very firm to the touch. Along it the finger passed about three inches, and was then reflected towards the vagina. The junction of the vagina and os uteri was very distinct, being about half an inch from the point where the finger was reflected, and formed a ring round the neck of the tumour, so that the finger passed through this contraction at every part into a cul-de-sac about half an inch deep.

No one had any doubt that it was a case of almost complete inversion of the uterus.

August 4th, 1867, an effort was made to remedy the accident. Chloroform was administered, and insensibility maintained for nearly an hour. The hand was introduced into the vagina, and by manipulation I endeavoured at the same time to compress the uterus and dilate the os uteri. Little or no impression was made on the tumour. She was in no respects improved, but the introduction of the hand had lacerated the remaining portion of the perinæum. Opium was administered, and rest enjoined for some days, in order to favour the union of the lacerated part, but without success.

I next determined to try the effect of continuous pressure.

It seemed to me certain that if an india-rubber ball were introduced into the vagina, and then blown up, it must at once compress the inverted womb, and stretch the vagina and os uteri, and that eventually the os uteri would become thoroughly dilated, and the pressure continuing to act on the uterus, this would at last be turned back again into its normal position. This idea I proceeded to carry out. The apparatus first tried was not adequate for the purpose; the hæmorrhage, indeed, ceased almost immediately under its use, but no change took place in other respects.

Eventually, Mr. Reynolds provided me with a pear-shaped india-rubber bottle, the neck terminating in a tube closed near its end by a stop-cock. By forcing air into it by means of an air-pump, the bottle could be dilated to a very considerable size without bursting. This was introduced into the vagina, and each day air was pumped in till she began to complain of pain. In an hour, or thereabouts, the pain ceased. When this had been done some days, I made an examination, and was surprised to find, not only that the tumour was unchanged, but also that the vagina was no larger than before its use. Before this examination the bottle had been removed. After a few days I examined again, the bottle remaining *in situ*. It was quite flaccid, and exerted no pressure on the canal. It was soon discovered that the stop-cock leaked, and consequently the air had escaped each day very shortly after the bottle was inflated, which fully accounted for the unaltered state of the vagina. The escape of air was prevented for the future by folding the tube in itself, and tying the fold tightly after each inflation. From that time the bottle was enlarged day by day, and when I next examined her the tumour was gone, the vagina very much distended, and the os uteri large and pulpy. Ten days later the condition of the parts was much the same. She left the Infirmary December 9th, 1867.

I regret exceedingly that no record is to be found of the date when the bottle began to be effectually used. I feel confident that it was not before the end of September, and more probably in October. The inversion must therefore have existed at least

five, and more probably six, months before elastic pressure was fairly commenced, and I believe the examination at which the inversion was found rectified was made in about a fortnight after its application.

For a long time after she left the Infirmary she remained anæmic, and suffered much from gastrodynia and other dyspeptic symptoms.

I saw her the last week in August, 1868. She had menstruated regularly for many months; and on making a vaginal examination the only abnormities to be noticed were, a large cervix uteri, some antiflexion of the uterus, and the ruptured perinæum, which I hope she will soon allow me to remedy.

THE USE OF COMPRESSION IN CERTAIN SURGICAL CASES,

By C. H. HIGGINS, M.D., M.R.C.P. Lond., F.R.C.S. Eng.,

FORMERLY SURGEON SOMERSET COUNTY AND BIRKENHEAD HOSPITALS.

I presume that few practitioners, to whom it has occurred to treat that common form of accident a "sprain," have not felt dissatisfied, if not humiliated, at the prolonged period which has intervened between the occurrence of the injury and the final recovery of the patient. However this may be, I must individually confess to have often experienced considerable disappointment formerly, on this score, with the result of such cases under my own care; so much so, indeed, that for several years past I have been in the habit of deviating more or less from the recognised methods of treatment; though I admit, until lately, with scarcely the amount of improvement I had looked for. Some four or five years ago, however, reflecting upon the circumstance that the ordinary bone-setter was credited with a better success in such accidents than the regular surgeon, I set myself to inquire wherein his treatment differed from the orthodox plan. To every such enquiry I found the same answer, viz., that his treatment mainly consisted in some form of plastering. Upon this hint I proceeded to experiment. The success which I obtained induced me to persevere, until, as I believe, I have now established something like a *system* in this plan of treatment; and having been invited to contribute something practical to the forthcoming volume of the *Liverpool Medical and Surgical Reports*, I desire briefly to draw attention to it. Before I do so, however, I must disclaim all desire or intention to exalt the bone-setter at the expense of my brother medicals; but I have always acted upon the

principle, *Est mihi nunquam recusare etiam ab hoste doceri*, and of the bone-setter's success in certain cases I certainly entertain no doubt; although I, as certainly, have no belief in his surgical knowledge or diagnostic accuracy; on the contrary, I believe that the bone-setter, either from ignorance, or from a worse motive, or perhaps from both considerations, invariably pronounces his cases to be of a more serious character than they are; and, playing upon the credulity of his patients, unquestionably intimates, *in every case*, that there is something "out," or something "broke," to enhance his own skill. Nevertheless, I am persuaded that in many instances he hits the right nail on the head, and adopts, from experience, a sort of "rule of thumb" practice, which proves successful and maintains his reputation. This "rule of thumb" practice, then, so far as I have been able to discover, is chiefly the plan of rigid plastering, thereby securing, at the least, the immobility of the injured limb, thus facilitating the efforts of nature in bringing about the recovery.

I may add that I have never seen a case put up in the way I shall presently point out, by any bone-setter, or any other person. The plan, therefore, which I adopt has been worked out by myself upon the merest hint. And I beg to say also, that I desire to set up no sort of claim to originality; for I do not know whether the same method has or has not been employed by others. It certainly has never been alluded to or suggested by any one on this side of the Mersey, and I have seen no account of it.

The plan then which I have pursued during the last four or five years in all cases of sprain is as follows:—immediately on seeing the patient, and satisfying myself of the nature of his accident, I plunge the injured joint, say the ankle or the wrist, which are the parts most exposed to sprain, into a vessel containing water as hot as can be borne, and keep it there for at least two hours, maintaining the temperature of the water by fresh quantities of the hot. At the end of the time specified, I find the pain of the part considerably mitigated, and it is, of course, very greatly distended and swollen. Having next carefully dried the part, I proceed *at once* to strap it, (if the ankle, from the toes to the middle of the calf, and if the wrist, from the fingers to the

middle of the fore-arm,) as *tightly* and *equally* as I can, with common adhesive plaster cut into strips an inch wide, placing each succeeding piece so as to overlap the preceding one by about a quarter of its width. I always put on two such layers, and finally I direct the patient to keep the horizontal position, on no consideration to meddle with the dressing, but if much pain or distress is set up to take an opiate on retiring to rest. Upon visiting my patient on the following day, I usually receive some account of a restless night during the first hours, but subsequently of sleep and diminution of pain, etc. The plasters are generally quite loose from the shrinking of the limb, which is moreover now said to be comparatively free from pain, unless handled roughly—though of necessity much discoloured; having removed the plaster, I immediately replace it by fresh strips laid on as firmly, evenly and extensively as before; in short, exactly in the same way as on the first dressing, insisting of course on a continuance of the recumbent position. On the third day of the accident I repeat the process, this time, however, allowing two days to intervene, and I permit some movement about the room. At the end of the two days, I renew the plaster-dressing exactly as on the previous occasions, and generally for the last time, retaining this dressing until it loosens itself off, which usually occurs in three or four days, by which time I find the patient able to use his limb, and free from pain; in short, cured. Such is my proceeding in ordinary cases of sprain; where the accident is of unusual severity, I have had recourse to *six* relays of plaster instead of *four*, and up to the present time with equal success, though the cure is generally delayed three or four days or so longer.

The first case I treated on the above plan was that of a former student of the Liverpool Medical School, residing at the time on this side of the river, and at present a Surgeon in the army. This gentleman took it into his head to leap down the last four or five steps of a common flight of stairs with an adult sister in his arms. He fell with his right foot doubled under him, and suffered a most severe sprain of his ankle. I saw him shortly after the accident and found him in intense agony, etc., and quite unable to move his foot, which was already much swollen. Not having perfect

confidence in my plan of strapping, I immediately applied a full number of leeches, and then had his limb well fomented and ultimately enveloped in a bran poultice, and enjoined complete rest in bed. The following morning I repeated the leeches and fomentation, as there were still considerable pain and distension. On the subsequent day, I timidly commenced the plan of compression, using for the purpose a common firm calico bandage, which I applied firmly. As he expressed relief from the support, I rigidly continued the compression, removing and re-adjusting the bandage as the swelling diminished. Three weeks from the date of the accident, he was able to draw on an ordinary Wellington boot and go out shooting; and in a couple of weeks more he reported himself as quite recovered, and resumed his studies.

The next case I was called to was that of a lady, about 45 years of age. She slipped down the kitchen stairs, sustaining a sprained ankle. I saw her three or four hours after the fall, and found her ankle swollen and intensely painful. I caused her to foment the limb for a couple of hours. At the end of that time, having reasoned myself into more confidence of the method, I tightly strapped the foot and ankle, from the toes to the middle of the leg, with strips of ordinary adhesive plaster. She bore the strapping for some hours, but at length, becoming impatient of the distress occasioned by the dressing as she supposed, before my visit on the following day, she had loosened and to a great extent removed it. I re-adjusted the strapping; and on the next day, finding she had again loosened it, I applied, in place of common adhesive plaster, emplastrum roborans, spread on linen and cut into strips like the former. Seeing me so determined, and not finding it quite so easy to remove the new strapping, she had not meddled with it; and after two or three days more, perceiving that the swelling had greatly diminished and the plaster consequently loose, I applied fresh strips as firmly as I could. The parts were by this time much less painful, and reduced, and my patient, being now convinced of the advantage of the compression, contentedly submitted to two or three renewals of the plastering, and in a month from the accident she was quite recovered, and able to walk about well.

Another case was that of a young gentleman, about 20 years old, who severely sprained his ankle in leaping from the landing-stage on to one of the Woodside boats. He was brought home, not being able to put his foot to the ground, and I saw him three or four hours afterwards. He complained of great pain, and his foot and ankle were much swollen and discoloured. I had his foot placed for a couple of hours in a bucket of water as hot as he could bear it, and then tightly and evenly strapped the limb in the way already described, from the toes to the middle of the calf, and enjoined the recumbent position; the next morning he reported a somewhat restless night and some distress from the plaster, which, as usually happens, I found loose, from the shrinking of the parts. I restrapped the limb tightly, and he expressed himself easier when the operation was finished. Two days afterwards I applied fresh plaster, and again in two days, as the limb had now nearly returned to its usual size; this was the last application of plaster, for he could now walk tolerably about the room. At the end of ten days I saw him dancing at a party, and in one fortnight from the date of his accident he returned to his office duties, perfectly recovered.

The next opportunity I had of testing my method of treatment was in the case of an officer in one of the Inman line of steamers, who had a fortnight before sprained his ankle by slipping on the ice at Halifax, *i. e.*, the day before he sailed for Liverpool. He was entirely laid up during the voyage, and when he reached home was quite lame, and suffering from pain in the ankle joint. I pursued the plan I have already so fully detailed in the former cases. He underwent four strappings, and at the end of one week, though still wearing the last dressing, he was able to walk about without pain or limping.

Lately, one of my sons in leaping a gate fell, and sustained a most severe sprain. I pursued precisely the same plan as in the other cases, and though he suffered some considerable discomfort from the first application of plaster, he recovered without a drawback, and in less than a fortnight, though much discolouration continued almost up to the knee, he was able to resume his office

duties, which entail on him a great deal of walking, without pain, etc.

A short time ago I had the opportunity of testing my plan upon myself, and, what is more, of contrasting it with the treatment I was subjected to for a similar accident some years previously. I was returning home some months since, late at night, from a patient's house, and stumbled over a large stone carelessly left in the road, and met with a severe sprain of the left wrist-joint. My hand was quite powerless, and extremely painful. I caused straps of plaster, in the usual way, to be tightly applied, from the base of the phalanges to about four inches above the wrist. These were renewed three times, and in five or six days I was free from uneasiness, and could use my hand almost as well as ever, and in a couple of days or so more had quite recovered, and have never felt inconvenience since.

From this accident to myself, I need scarcely say, I had an opportunity of measuring the amount and sort of discomfort occasioned by the first application of the strapping. This I found to extend over only the first six or eight hours, and, though certainly sufficiently distressing, it was by no means so great as I had anticipated, and consequently quite worth undergoing to ensure the after-benefits of the treatment, and indeed quite compensated by the sense of security and support it produces, the absolute immobility in short, of the injured structures.

I have lately had an opportunity of proving to some extent the efficacy of compression, by the method I have described, in two or three cases of contusion, also in one case of dislocation of the elbow joint, in a member of my own family; and I may add also in two cases of gout in the foot. Here I delayed the application of the plaster strips until all inflammatory appearances had subsided. The benefit of the compression in both instances was considerable, not only from the support it afforded, but also by inducing absorption of the insterstitial deposits.

When we reflect upon the nature of a sprain,—that it is indeed a kind of subluxation, a more or less partial and temporary displace-

ment, as it were, of all the structures about a joint, accompanied by considerable stretching, and even laceration of its ligaments, its tendons, its fasciæ, its vessels, and its nerves,—I think we shall be safe in acknowledging that a judicious system of compression, early employed, must be a more efficacious method of treatment for its cure than the old temporising plan of leeches, cold lotions, stimulating liniments, etc., etc., with ultimate timid bandaging.

By compression, employed in the manner I have endeavoured to point out, I do believe we can bring about, more surely and more quickly and more comfortably to the patient, the various desiderata in the cure of sprains and similar cases. In the first place, we may ensure the complete, the absolute immobility and repose of all the injured structures. In the next place, we are enabled to restrain the greater amount of the extravasation and effusion which will of necessity be poured out, in and around the joint, unless prevented. And we may also promote at once the re-absorption of all insterstitial outpourings, be they of blood or of serum, which so frequently complicate the recovery in such cases, and compromise the symmetry of the parts, and we can restrain within due bounds the tension and vascular action of the parts. And lastly, I am sure now, from experience in my own person, that we shall conduce to the ultimate and not long-delayed relief of the parts involved, and therefore to the general comfort of the patient.

Whatever may be the worth of my explanation of the *modus operandi* of compression, as I have recommended it, in sprains and contusions and all analogous cases, I can unhesitatingly vouch for the superior efficacy of this plan of treatment. And if I succeed in merely drawing attention to my suggestion, I shall be satisfied, and shall feel at least *non ego frustra*.

ON LOCAL APPLICATIONS TO THE THROAT AND NOSTRILS,

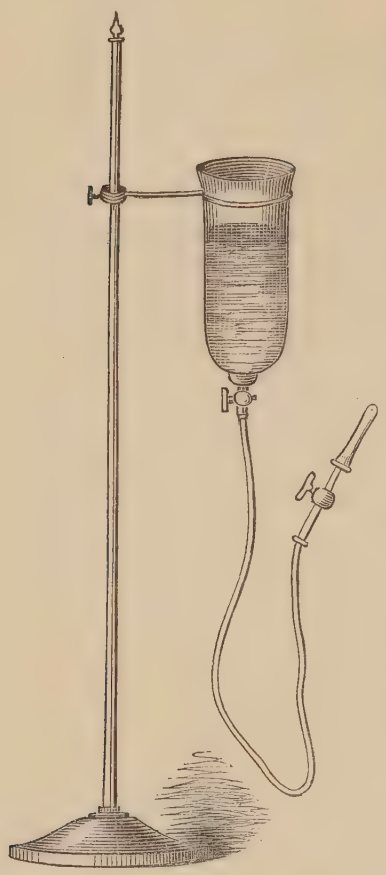
By W. M. BANKS, Esq.

Within the last few years the nature and treatment of the diseases of the air passages, like those of the eye, the ear, and the genito-urinary organs, have occupied the attention of some of the ablest minds in the medical profession, and have made the most extraordinary advances. The necessary result has been the introduction of numerous remedies and instruments which, till quite recently, were never heard of; and as these have appeared before the public in such rapid succession as hardly yet to have taken their places in the standard text-books of surgery, a brief comparison of the merits and *modus operandi* of some of the most useful of them may not be unacceptable.

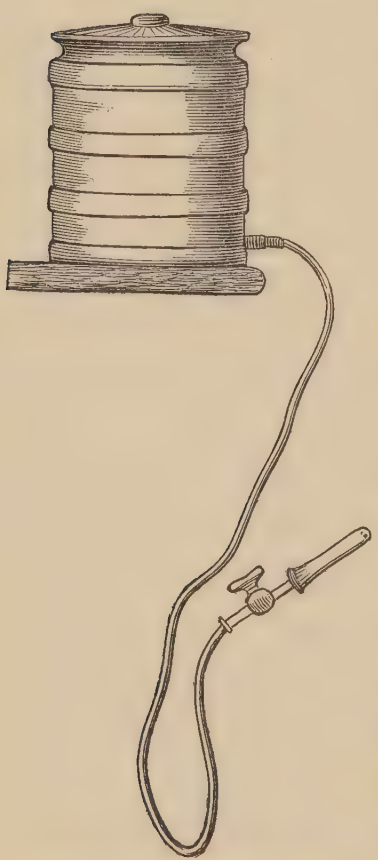
I should imagine that, twenty years ago, when a medical man was consulted by a patient, the victim of ozæna or chronic laryngitis, a feeling, almost of dismay, must have come over him, at the prospect of how little he could really do in the way of permanent benefit. But, of late years, there has been a growing tendency to explore the more inaccessible regions of the body, and so successfully has this been cultivated, that the cavity of the uterus, of the eye-ball, of the larynx and nostrils, nay, even of the bladder itself, can now be displayed for our inspection and mani-

pulation. The result is, that, whereas we were formerly satisfied with constitutional treatment in cases of disease in those parts, or, at best, with vague and haphazard modes of local application, we can now deal with them, almost as effectually, as we can with the more patent portions of the body. In the following remarks I do not propose to offer anything in the way of a novelty, for we cannot all be discoverers;—indeed, at the present day, the race of discoverers and inventors seems to be quite prolific enough. But many a medical man, though worried with the cares of practice, yet anxious to keep up with the spirit of the times, reads in some journal of a new remedy or a new instrument;—he hears it talked of, for a time, while it is still a novelty, by his friends or at societies, and proposes to himself to employ it the first chance he gets. The case comes; but, alas, the instrument is not at hand; he is not quite sure where it can be obtained; he has somewhat forgotten the exact way in which it was to be used and the exact complaint it suits; he hesitates to order it, and falls back upon his old plan of treatment, which he has at his finger ends. As every one will admit that this is only what too frequently occurs, I must plead it as my apology for recalling to the memory of the readers of this journal what most, if not all of them, have already either seen or heard of, though perhaps not absolutely put in practice.

To begin then with the nostrils. There are few complaints more distressing than ozæna, which leaving the patient, as it does, sufficiently well to perform all the ordinary duties of life, is yet a continual source of misery to him—a veritable thorn in the flesh. The blocking up of the nostrils and consequent hindrance to free breathing, the alteration of the voice, the constant discharge of blood and matter and mucus, and hardened inspissated crusts, and, above all, the loathsome smell which is an inevitable concomitant of the disease, render the patient a burden to himself and a nuisance to his friends. A very great boon was conferred on such sufferers, by the discovery, made by Weber of Leipzig some forty years ago, that when a column of water is passed along one nostril, the moment it impinges on the soft palate, it causes that structure to rise upwards and completely shut off the nasal



Thudichum's Instrument.



Modification of the same.

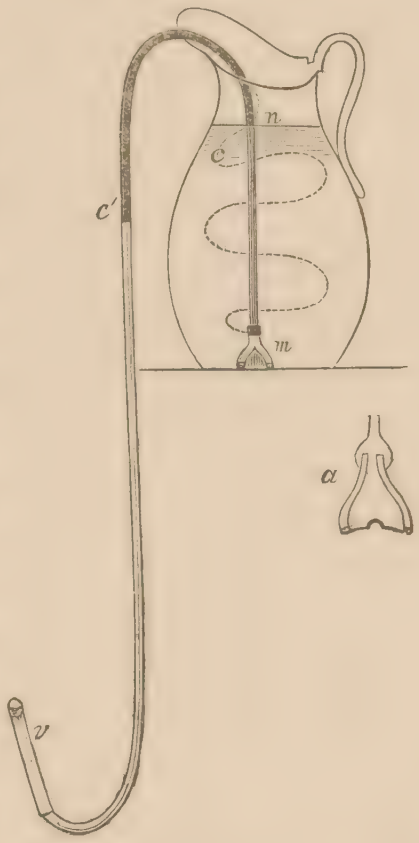
from the pharyngeal cavity, thus compelling the fluid to pass round the posterior edge of the nasal septum and emerge by the other nostril.

Another German professor at Halle, also named Weber, was the first to carry the principle into practice, and, in 1864, two articles upon the subject, by Dr. Thudichum, appeared in the *Lancet*, describing an apparatus which he had invented, and which has since gone by his name.

It consists of a heavily-weighted stand, having attached to it, by means of a movable arm, a glass jar, which contains the fluid to be employed. Connected with the bottom of this jar is a flexible tube, fitted at its further extremity with a perforated boxwood nozzle, and provided with a tap to regulate the flow of the liquid. The patient stands or sits with the mouth wide open and the head vertical, not thrown back, as he naturally inclines to do at the first impulse. The nozzle is fitted pretty tightly into one nostril, the tap opened, and presently a continuous stream pours out of the other nostril. The force and volume of the stream are increased by elevating the glass vessel on the shaft of the stand, and opening the tap to its full extent, and *vice versâ*. As this instrument is rather a costly one, a very much simpler variety is made by Mr. Reynolds, of St. Anne Street, Liverpool, consisting merely of a white delf jar with the tube screwed into an aperture close to the bottom. The jar is placed on the top

of a table, or any high piece of furniture, and so the necessity for a cumbrous stand is done away with. The price of this instrument places it within the reach of almost any one.

Mr. Christopher Heath, however, having recognised the utility of the instrument, and being anxious to put it in the power even of the poorest dispensary patient to provide himself with it, has reduced it to the utmost simplicity, by doing away with the jar and the tap altogether, and merely having about seven or eight feet of india-rubber tubing, armed at one end with the nozzle, and at the other with a perforated leaden weight. An ordinary jug, filled with the requisite medicament, is placed, say, on the top of a chest of drawers, and the weighted end of the tube sunk in it. Into the fluid are then paid about a couple of feet of the tubing, which is next pinched between the finger and thumb, close to the margin of the liquid, and being drawn up over the edge of the jug, a syphon is formed, and the water or the saline solution, as the case may be, flows freely along the tube. By pinching the tube, the volume is diminished at pleasure, thus doing away with the necessity of a brass tap, and so the cost of the instrument is reduced to a few shillings. One great advantage of this form is that, being extremely portable, it can be easily carried about by persons who require to travel, but, when there is no such necessity on the part of the patient, the second form is, without doubt, much more convenient to manage.



Mr. Heath's form of Thudichum's instrument.

a. Section of perforated metal weight.
c. Tube coiled in the fluid.
c'. Tube drawn over edge of jug.
v. Nozzle.

In the using of the instrument there are one or two points to be attended to. In the first place, it should be seen that the nozzle fits the nostril accurately; and secondly, in the case of children or

nervous people, the full stream of fluid should not be turned on at first, as, if this is done, they begin to splutter and cry out, the soft palate falls, the fluid runs into the pharynx, and you have the process to begin over again. The fluid should be allowed to run gently through at first, and then its volume and force increased, either by turning on the cock to its full extent or by elevating the reservoir. Also, having let a sufficient supply of fluid run up one nostril, it is advisable to insert the nozzle into the other, and reverse the current, as, by this means, the hardened crusts which have been detached, are much more easily got quit of.

As was pointed out by Dr. Thudichum, pure cold water is irritating to the mucous membrane of the nostrils, much more so than tepid water, or even than a saline solution, while this last possesses, in a marked degree, the property of dissolving the inspissated mucus, and loosening the hardened crusts. The patient should, therefore, be directed, on first rising in the morning, to run through the nose a pint or two of a solution of common salt in tepid water; about an ounce or more to the pint. This cleanses the mucous membrane, and then either a deodorising or an astringent fluid should follow. The best deoderants are Condy's fluid, the liquor carbonis detergens, and carbolic acid; about a teaspoonfull of the two first to a breakfast cup of water is enough to begin with, and about 1 part of carbolic acid to 120 of water. I tried them all successively in one patient, who gave her verdict in favour of the carbolic acid, as affording her most relief. After persevering for some time with the tepid salt and water, followed by deodorants, the mucous membrane gets clean enough to permit of the action of remedies having a permanently curative object. Of course stimulant astringents are what are indicated. The cheapest and most readily obtained is common alum, of which about 2 drachms to the pint is enough, or the sulphates of zinc and copper (from 10 to 30 grains to the pint) may be used. The practitioner, however, may employ his own favourite remedy, whatever it is, provided he follows Dr. Thudichum's advice, not to make it too strong at first, as he found that when the nasal cavity is filled with fluid, even although it be very aromatic, the sense of smell is entirely obliterated, and, the reflex effects which sub-

stances may exercise being thus absent, the application of very potent (and it might thus happen of *too* potent) remedies is borne without much inconvenience.

The following case shows how, when an ozæna is taken in time, a complete cure may be effected.

Last January I saw Frederick D., a lad of about 17, with red hair, blue eyes, freckled face, and generally strumous-looking appearance, but yet in good health and well nourished. About five months previously, a companion, who slept in the same room, noticed that he snored heavily at night. Then he himself began to feel his nose stuffed in the mornings, and soon a thickish yellow fluid commenced to run from it, which speedily assumed a very offensive odour. He never bled from the nose, nor was he much troubled with hardened crusts from the nostrils. He was ordered cod-liver oil, and to use Thudichum's apparatus with tepid water. In a week he breathed more easily through the nostrils, and did not snore so badly at night, while the smell was much diminished. At the end of a month, as the discharge, though inodorous, still continued, he was told to wash out the nares with salt and water, and then run through them half a pint of a weak solution of tincture of iodine and carbolic acid, which in two or three weeks had the effect of reducing the discharge to a thin muco-purulent condition. He came once more, after the lapse of another month, and reported himself quite well. He no longer snored, his nostrils were quite free, there was neither discharge nor odour, and he had fattened considerably upon the cod-liver oil.

I have no doubt that, under the old method of attempting to clear out the nostrils with a miserable little glass syringe, this lad would have gone on from bad to worse till his complaint became as confirmed as that of the girl whose case follows.

Annie R., when two years old, had a button up her nose, which remained there for two years. Ever afterwards she suffered from a profuse greenish discharge, accompanied by dreadful fœtor, but very little pain. Till she was 17 she tried to keep it under by all sorts of injections and washes applied by the usual glass syringe, but in vain. In October, 1866, she employed Thudichum's instrument, and was treated in the same manner as

Frederick D., and in the course of three months the disease, though not radically cured, was so palliated as hardly to occasion her inconvenience. She described to me her former condition as being something dreadful; no one would take her as a servant, and the stench was so overpowering that her very relations shunned her. At present she is in service in a family, none of whom, except her mistress, know that there is anything the matter with her. Five minutes washing out in the morning keeps her all right for the day. Nevertheless, she feels that she cannot do without this, as the nostrils still tend to get blocked up with crusts during the night. She is fat, looks well, and seems to enjoy excellent health.

A short time ago I saw a stout healthy-looking sailor lad, about 19, who for five or six years had been a victim to ozæna, which had lately become quite intolerable. On his efforts to clear the nose, he often made it bleed most severely, and the stench from the discharge was so offensive that on his last voyage home the other sailors would not allow him to sleep in the forecastle beside them. He got one of Mr. Heath's variety of the instrument, and in a month he came back and announced with great gratitude that his nose was much clearer, the discharge was rapidly diminishing, there was no bleeding, and the fœtor was quite gone. He was going to sea in a day or two, armed with his instrument and a big bottle of Condy's fluid. I had no doubt that he would be permanently cured in time. Even if he were not, the case of Annie R. shews that by a few minutes' washing out each morning the disease can be deprived of all that makes its victim unhappy, for the absolute pain is extremely trifling as a rule. Among the better classes, who can obtain country air, sea-bathing, and all the other aids to constitutional treatment, a complete cure is the rule and not the exception, and I know of many such which have occurred in the private practice of Mr. Bickersteth within the last two years.

There are two surgical accidents in which I am sure that Dr. Thudichum's instrument will not unfrequently be found of service. The first of these is the case of impacted foreign body in the nostril. Children, as every one knows, seem possessed of a

mania for putting beads, marbles, beans, and similar objects into the nose. They seldom put them very far, or very firmly in, and there is no doubt that the actual impaction, or fixing of them, is often produced more by misdirected attempts to get them out than by anything else. I should certainly, before using any forcible efforts at removal by instruments, see what effect a rapid stream of water passed up the other nostril would have in dislodging the foreign body. In the number of the *Lancet* for December 17th, 1864, Dr. Skinner, of this town, shewed that long before Dr. Thudichum's paper appeared he had been practically making use of the principle upon which it is constructed. Dr. Skinner discovered it by mere accident, the instrument he employed being one of Higginson's syringes. In this letter, he gave the following very interesting account of the removal of a bead from the nostril. "In June, 1860, the child of one of my patients was brought to me,—a little girl, two years of age, who had pushed an Indian bead up the right nostril. The mother had made vain attempts to pull it down, and succeeded in pushing it entirely out of sight, accompanied with profuse bleeding and terrific squalling. While the mother held the child's face over my basin, I forcibly injected some tepid water, by means of Higginson's syringe, up the left nostril, when the bead with one single compression of the elastic cylinder made its appearance in the basin."

In the second place, I think that the instrument may prove serviceable in cases of severe epistaxis. Plugging is a troublesome and disgusting remedy, and not altogether devoid of risk. Cases are recorded where serious disease of the nose has been set up by portions of the plugging having been retained. I should imagine that a stream of some dilute hæmostatic, passed through the nares, would, in many cases, suffice to stop the bleeding, and so obviate the necessity of adopting severer measures. The following case illustrates the value of the spray producer in such circumstances. It occurred in the practice of Dr. Cregeen, of this town, who has very kindly furnished the following particulars.

In September, 1867, Miss E. M., aged 20, began occasionally to spit blood, having for several months previously suffered at inter-

vals from bleedings at the nose, which, however, were so slight that she never even told her parents about them. She spat up the blood on the slightest exertion, but yet her general health was very fair, she did not emaciate, the menstrual function was regular, and stethoscopic examination revealed no evidence of disease of the lungs; in short, it was difficult to say positively where the blood came from. In the early part of this year she again had some severe attacks of epistaxis, which she said nothing about, for fear of being kept in the house and "invalided," but one day in March she had an attack, in which such a quantity of blood was lost that syncope ensued. The bleeding recurred thrice in the same day, and, the usual remedies proving useless, her medical attendants plugged the nares very thoroughly. Strange to say, even while the plug was in, she vomited blood, which had evidently been swallowed. The plug was removed and all kinds of styptics were employed, together with rest, proper diet and internal remedies, such as digitalis, aconite, &c., calculated to moderate the force of the circulation, but in vain. For more than a month she had attacks of epistaxis and vomiting, from two to four times every week, till she became utterly exsanguine, as the quantity of blood lost each time was very great. In the end of April she came under Dr. Cregeen's care, who had her removed to New Brighton, in the hope that the change of air might do good. She was by this time quite blanched, her appetite indifferent, the heart extremely irritable, and she herself so weak that she could not be taken out of the carriage to cross the river, and it had to be taken over in the boat with the patient in it. It was now pretty clear that the blood came from somewhere at the back of the tonsils and *upper part of the pharynx behind the soft palate*, and the difficulty was how to reach this. From some remarks of mine Dr. Cregeen was led to employ the spray, using tincture of perchloride of iron as the styptic. It was applied through the nostrils in the usual way, and seemed to do good, as there was no bleeding for three or four days. Then occurred some slight vomiting of blood, and afterwards, on May 14th, during one of Dr. Cregeen's visits, the patient was seized with an attack of epistaxis so severe that it was with difficulty she rallied from it.

The pupils were dilated to their utmost and insensible to light, and the patient became slightly delirious, tossing her arms about and muttering incoherently. The blood which ran from the nose was of the colour of sherry, and so devoid of fibrine that it would hardly coagulate. Dr. Cregeen tried to throw the spray up behind the soft palate, but she could not endure it. It was clear, therefore, that by the usual plan of blowing the spray up one nostril and down the other, the soft palate prevented its reaching the proper place, and, as she could not bear it when applied by the throat, Dr. Cregeen adopted the plan of putting the tube up one nostril, closing both the other nostril and the mouth, and then rapidly blowing in about a drachm and a half of the perchloride of iron with the spray producer. The valve action of the soft palate being thus destroyed, the iron reached the very top of the pharynx and ran down, drenching all the surrounding parts; the patient could feel it running down. This was done every day for a fortnight; she did not lose a drop of blood during that time. Dr. C. then began to dilute the perchloride of iron, when, in a day or two, she began to hawk up a little blood, and he again resumed the full strength. The spray was continued till July 22nd, and for some time at first it was noticed that whenever it was discontinued the patient felt symptoms of fulness in the head and throat, which always preceded an attack of bleeding. At the end of that time she was well enough to take carriage exercise, and was recovering strength. She accordingly went to Cumberland, having had no hæmorrhage for a long time. She quickly recruited there, and has never since had a return of her malady. To the effectual application of the perchloride of iron to the proper place, Dr. Cregeen very justly attributes his patient's recovery, as, previously to this, every possible means had been vainly tried, by several medical men, as well as by himself, to stop the bleedings.

I tried the iron myself in a very bad case of epistaxis, where repeated attacks of bleeding were rapidly exhausting the patient. Being an ignorant obstinate man, he positively refused to be plugged, saying he would rather die. I found the iron here

exercised very marked control over the hæmorrhage, and, the means of applying it being so simple, the patient's wife was able to give him a dose whenever an attack threatened, and so to cut it short.

Dr. Thudichum's instrument then, as we have seen, is highly applicable to cases of ozæna, or of true ulceration of the mucous membrane, or of caries of the spongy or nasal bones, where there is great discharge and fœtor. But the general practitioner is often also consulted, at any rate in the first instance, in cases of nasal polypi. Now, if unwilling to perform the operation of evulsion himself, and equally unwilling to hand over his patient to an operating surgeon, I would suggest a trial of a method of destroying them, proposed by Mr. Bryant about a year ago. It is well known that nasal polypi are seldom or never single, and that, after having removed all the larger ones with the forceps or wire noose, there is too often a crop of young ones left behind, which soon sprout up and involve a second, a third, and often several operations, before they are all got quit of. Mr. Bryant hit upon the happy idea of blowing tannin into the nostrils, after the operation of evulsion, for the purpose of withering up the young succulent gelatinous brood, which remain behind; and in this he was so successful, that he also tried it on the larger ones, and with very marked benefit. During the past year, I have used it in a few cases myself, and, in one or two, the effect has been most satisfactory, the polypi having either shrunk away, or actually dropped off, and so the patient has been spared the misery of undergoing a painful and very repulsive operation. A few grains of tannin are simply put into a quill, which is inserted as far as possible into the nostril, and then, with a puff, the powder is blown out over the mucous membrane. This, however, involves the presence of a second person to blow the powder up the nostril. I have found that this can be obviated by having the tannin put into a hollow india-rubber ball, with a short wide nozzle attached to it. A smart compression of the ball sends the powder flying up the nozzle, and so the the patient can employ the remedy himself.

These little implements are now sold in all druggists' and surgical instrument makers' shops, for the purpose of giving small injections. The nozzle of course must come out to allow of the powder being poured into the ball, and the tannin itself should be finely pulverised. The successful cases which I had were in young girls, and I should think that the remedy will act best where the polypi are not of very old standing, and seem to be soft and gelatinous. Mr. Bryant, however, details several cases, where it acted on polypi of very old date. He remarks at the beginning of his paper: "I am disposed to regard it as a practical wrinkle of no mean value in the treatment of a hitherto very intractable affection, and it is with some little pleasure that I now bring it publicly before my professional brethren." As far as my limited experience goes, though not so sanguine as Mr. Bryant in my expectations of the success of this remedy, it is certainly worth a trial, and especially in the cases of persons who, from timidity, prefer going about with their malady, to submitting to the pain of an operation. To such it gives a chance. As to its use after evulsion, as a means of keeping down any of the young brood which may have been left behind, that is unquestionable.

There is still another morbid condition of the nostrils, for which patients often seek advice. In these cases, the person continually has a sensation of having his nostrils stopped up, and is constantly blowing his nose to clear them out. The organ is always running water, and the patient speaks as if he had a bad cold in the head. Indeed, the symptoms are practically those of a chronic coryza, and are due to a chronically swollen and thickened condition of the mucous membrane. No doubt this can be brought on by repeated attacks of "cold in the head," but I believe it is to a great extent a constitutional affection, just as we find to be the

case with chronic follicular disease of the pharynx lower down. In the way of constitutional treatment, the iodide or bromide of potassium offer most hope of benefit. These salts seem to act upon the homœopathic principle of "like curing like," as, when given in overdoses or for too long a time, they produce the very train of symptoms I have just mentioned. Locally, astringents are undoubtedly indicated. Now, for the application of these, Thudichum's instrument is rather clumsy, while blowing pure tannin into the nostrils is rather too severe a measure. By far the most elegant contrivance, then, is that with which we have all recently been made acquainted, in connection with the use of sulphurous acid by Dr. Dewar's plan, viz., the spray-producer. The cloud of spray, thrown from it when it is inserted into the nostril, permeates every chink and cranny, and seems to act upon the soft palate, just as the fluid in Thudichum's machine does, since, if you ply the bellows-ball strongly enough, the spray will be seen to issue from the opposite nostril to that in which the instrument is inserted. By this means, the whole Schneiderian membrane receives a most thorough drenching. As to the fluid to be used, either tannin in solution or iodine are the best. If the tannin be used, the *Glycerinum Acidi Tannici* of the new *Pharmacopœia*, in the strength of one to two drachms to the ounce of water, will be found the most elegant mode of using it. The objection to using iodine, hitherto, has been that it stained the patient's skin and handkerchiefs and everything it touched. About six or seven months ago, however, I noticed a short letter in the *Lancet*, stating that the addition of a little carbolic acid not only prevented this nuisance but was a desirable addition in itself. I have used it since very freely, and seen it used by others, and find that it answers extremely well, and is probably the best and most generally applicable remedy in use.

Having now discussed some of the best methods of applying remedies locally in the case of the nares, it may not be amiss briefly to notice how a similar plan of treatment is to be adopted with the throat.

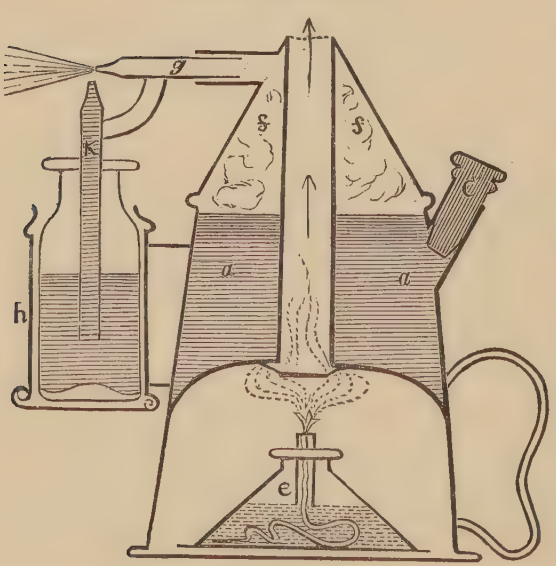
The affections of the throat most commonly met with are, speaking very roughly and generally, as follows: — (1) Ulcer-

ation of the larynx either of a syphilitic or of a tubercular origin; (2) chronic follicular disease of the pharyngeal mucous membrane associated with more or less hoarseness and pain in speaking, known as *dysphonia clericorum;* (3) aphonia, or loss of voice, which when merely temporary is only the result of congestion of the mucous membrane of the vocal cords after a bad cold or a sore throat, but when permanent generally proceeds from defective action of the laryngeal muscles. This defective action is due, either to some distinct paralysis of the inferior laryngeal nerve, or to extreme general debility. Of course, there are many other affections, which come under the notice of the specialist, but these are the most commonly met with in the general run of practice.

The desire to obtain some means by which we might actually bring our remedies in contact with the affected air passages, has led to the invention of numerous instruments for that purpose. Inhalation of the steam of water, impregnated with the medicinal agent, was the first idea; and of inhalers there is literally no end. To this succeeded Rauchfuss's plan, of squirting in the remedy itself, in the form of very fine jets; and, after sundry modifications, this resulted in the production of an injector, consisting of a silver or vulcanite tube, curved to suit the larynx, and having one end perforated with numerous fine holes. To the other end was fixed a hollow caoutchouc ball, which was filled in the same manner as the enema apparatus which are now in common use, and, when firmly squeezed, forced the liquid in a fine shower through the holes in the perforated extremity. These instruments were very much used a few years ago, and some of them were constructed with long stems, for the purpose of being passed up into the uterus and along the urethra. Next came the "Pulverizateur," of Dr. Sales-Giron, in which, by means of compressed air, the medicated fluid was forced through a tube with a very fine aperture against a metal plate, by which the stream of fluid was arrested, broken into spray, and inhaled by the patient. But the greatest improvement of all was the invention of Dr. Bergson of Berlin, of two glass tubes, with capillary points placed at right angles to each other, so that the further end of one of them being placed in fluid and a stream of air forced through the other, the fluid was sucked up through the former and

distributed in the form of spray. Every one speedily became familiar with this under the shape of the "Odorateur." Dr. Siegle of Stuttgardt, adopting this invention, constructed an instrument in which steam is made the dispersing agent, and, till quite recently, this was certainly the best apparatus of its kind, sending the remedy, in the form of spray, combined with a jet of warm steam, right to the back of the throat, and permitting of its being drawn down into the lungs at every inspiration. The price of these instruments, varying from thirty to fifty shillings, was, however, a drawback to their general use, for one does not like to ask a patient to expend so much money on what *may*, after all, not prove serviceable to him, while poor people positively cannot afford it. Last year, Dr. Adams of Glasgow most ingeniously contrived to simplify the apparatus, just as Mr. Heath has done with Thudichum's machine, and has reduced its price to a matter of five shillings, rendering it at the same time much smaller and more easy to work.

Dr. Adams' steam spray inhaler.
External appearance.

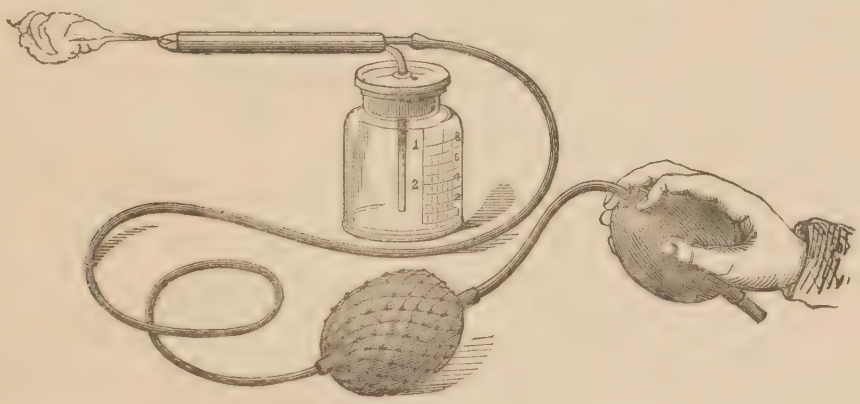


The same. Sectional view.

The instrument, which is made of block tin, and is only about five inches in height, resembles very much a common lamp. It consists of a tubular boiler (*a a*) with an opening into which the water is poured, and which is fitted with a cork (*c*) which acts quite efficiently as a safety valve, since, should the pressure of the steam prove excessive, it will certainly be blown out before the boiler will burst. From the position of the opening only the proper quantity of water can be poured into the boiler. The lamp (*e*) being lit, steam is generated in the upper part of the boiler (*f f*), and

rushing through the upper tube (*g*) which leads from the boiler, it sucks up the medicated fluid from the bottle (*h*) along the lower tube (*k*), and carries it along with it in the shape of a warm soothing mist. The advantage of the tubular boiler is, that the steam is generated quicker, and a fuller supply kept up, while it is at the same time super-heated and dried. In simplicity and ease of management this instrument, if steam is desiderated, cannot be surpassed, and it may be safely intrusted to the care of the most inexperienced nurse or servant without fear of danger.* Dr. Adams's instrument is capable of being used in all diseases of the throat and larynx, but my own impression is that the steam does best when the bronchi are to be reached. Cases of gangrene of the lung and fœtid bronchorrhea can be deprived of much of their loathsome nature by this means; and in many cases of chronic bronchitis and phthisis, when the hacking night cough deprives the patient of his sleep, a most soothing effect can be obtained by a good inhalation, before bedtime, of some balsamic or narcotic tincture.

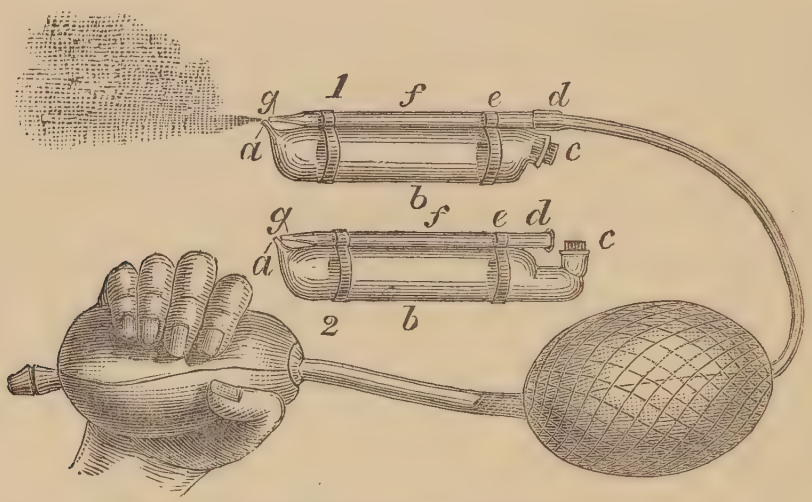
Within the last eighteen months, since the rise of the great sulphurous acid mania, not only the profession, but the general public, have become familiar with the instrument which goes by the name of "*The* Spray-producer," and which consists of a modification, by Winterich, of Bergson's tubes, having attached to them Dr. Andrew Clark's hand-ball, by which air is employed as the atomising medium. The adjoining woodcut represents the



instrument. Messrs. Mayer & Meltzer, of Gt. Portland street,

* Mr. Reynolds keeps this instrument in stock, and has added, at my suggestion, a small wooden mouthpiece to guide the jet of steam to the patient's mouth and prevent its going over his face.

London, keep the tubes with points constructed to direct the jet of spray either directly backwards against the pharynx, or upwards behind the soft palate, or downwards to the larynx. They also have a smaller tube, intended for the nostrils, the delicate point of which being protected by a small vulcanite ball prevents the patient doing it or himself any harm. Last February, in the *Medical Times*, a new form was made known to the public by Dr. Brakenridge, which is intended to be portable, and capable of



Dr. Brakenridge's Portable Spray Producer—(two forms).
a. b. c. Lower tube, acting as a reservoir. *d. f. g.* Upper tube. *e.* Connecting bands.

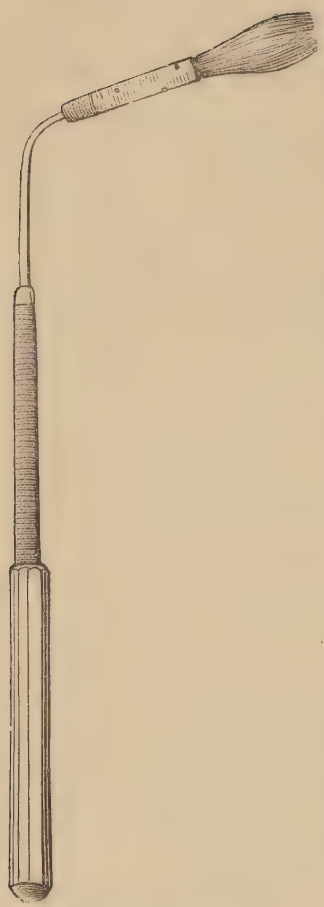
being carried in the pocket without fear of breakage. As seen by the illustration, the bottle is dispensed with, and the lower tube fulfils the office of a reservoir. The instrument, enclosed in a neatly fitting leather case, is about four inches in length.*

The value of the spray producer is so self-apparent as to account at once for its popularity, and one of its principal merits is, that it can be worked by any body after a single trial. Very few people, as a rule, can swab out the larynx satisfactorily, and patients, after a little while, are apt to get tired of the trouble of fixing up the larger instruments in which steam is the atomising agent; but this is small, portable, easily managed, and ready at a moment's notice. Of its applicability to cases of disease of the nasal mucous membrane I have already spoken, and its value in chronic throat affections I have thoroughly satisfied myself of; but I am also sure that we have in it a most efficacious weapon in com-

* Obtainable from Mr. Gardner, 46, South-bridge, Edinburgh.

bating such serious acute affections as putrid sore throat, scarlatinal cynanche, and diphtheria itself. Hitherto one of the greatest desiderata has been to obtain some means of getting at the disease after the swelling of the parts has rendered useless our attempts by the ordinary methods of gargling, or swabbing, or touching with solid caustics, while the patient has become too exhausted to undergo the fatigue of inhalation. In such a case, if we can only introduce the nozzle into the patient's mouth and get him to draw down the disinfecting spray as it is poured forth from the instrument, we may not be too late to check the advance of disease. In the August number of the new journal, "*The Practitioner*," Dr. Beigel, whose labours have tended greatly to popularise the use of atomised fluids by inhalation, has drawn attention to this very point, and strongly advises the use of spray in croup and diphtheria. As to the remedies to be employed, I need say little or nothing, they depend so much on the special case to be treated. As astringents, alum, nitrate of silver, and the glycerine of tannic acid, are in universal use; and as antiseptics, iodine, carbolic acid, and though last, not least, the much-talked-of sulphurous acid, are probably the best. There has been a good deal of writing lately upon the value of iodine inhalation in diphtheria, and I think that the compound of iodine and carbolic acid, which I referred to a short time ago, will be found a very excellent remedy. Dr. Beigel, in the paper just referred to, gives the preference to lime water (about 1 to 30 of water), (to which is ascribed the power of dissolving the pseudo-membranes of croup and diphtheria), and repeats the inhalations every two hours.

One more point I should like to mention. Valuable as is the spray producer in all laryngeal affections, it is obvious that by it we cannot make use of remedies so potent, that while they act beneficially on the limited diseased part, will yet injure the neighbouring healthy surfaces. For instance, we may wish to touch the vocal cords and the epiglottis with a sixty or eighty grain solution of nitrate of silver, but it would never do to saturate the mouth and fauces and pharynx with this also. We must then have recourse to swabbing the larynx itself as first proposed by Dr. Green. The original instrument used for that purpose consisted



Laryngeal Brush, with Aluminium stem.

of a round sponge fixed on a bent whalebone stem. Now I feel sure that with this sponge, nine times out of ten, the larynx proper is never reached. It scrapes along the pharynx, impinges on the epiglottis and doubles it up; the patient gasps and chokes, and we are glad to pull it up before it is really half way down. The form of this swab was afterwards very much improved by the bent part of the whale bone stem being elongated, while the sponge, in place of being round, was cut long and narrow so as to slip into the larynx. But I am certain that a brush is the proper thing to use. Sir Duncan Gibb, than whom we have no better authority on such points, says, "I have wholly abandoned the sponge, from the irritation it produces, and the manner in which it scrapes and injures the delicate membrane of the larynx." I fully assent to his his remark, and am sure that after using the brush any one would at once discard the sponge. In passing the brush, a little nicety makes all the difference between getting the remedy on to the spot and not. Make the patient open his mouth widely and permit his tongue to lie flat in the floor of the mouth, or if he cannot, then press down the base gently but firmly with a speculum (nothing answers better than the handle of a tablespoon for this); then wait a second, and ask him to take a full steady inspiration; at that moment the soft palate generally rises a little, the glottis is open, and you slip your brush rapidly down upon the vocal cords. In the way of remedies to be used, nothing can come up to nitrate of silver, and from forty to eighty grain solutions can be quite safely used, and with as little irritation as weaker ones. However, there is one form of very irritable pharynx to be met with—not true follicular disease, but where the mucous membrane at the back of the throat seems dry, glazed, and angry-looking, and for that variety equal parts of glycerine and turpentine will be found much more soothing than the nitrate of silver. In the very practical and

valuable "Therapeutic Memoranda," which recently appeared in the *British Medical Journal* from the pen of Dr. Symonds, I see that that gentleman also strongly recommends the turpentine and glycerine for a variety of throat affections.

In concluding these somewhat desultory remarks, I would observe that any practitioner who wishes to treat diseases of the nose or throat upon rational principles, and with anything like a certainty of success, must undoubtedly employ local remedies; and of the various instruments for that purpose which I have mentioned in this paper, I would recommend the following:—Thudichum's modified apparatus, as sold by Mr. Reynolds; the "Adams" Inhaler, a spray producer (Dr. Brakenridge's form, if it is to be carried about), and a laryngeal brush. Armed with these, and a few bottles containing nitrate of silver solution, tannin and glycerine, iodine and carbolic acid, Condy's fluid and turpentine, he will do his patients more good than if he poured the whole Pharmacopœia into their stomachs. I do not, at the same time, wish it to be understood that internal remedies are useless; far from it. Every means should be taken to keep the patient's health up to the mark, by the use of tonics, cod-liver oil, good diet, fresh air, and all the hygienic measures in our power. But what I desire to shew is, that now-a-days we have the means of getting at the parts themselves, and that, such being the case, we should no more treat diseases of the nose or throat by constitutional means alone, than we would think of treating a strumous ulcer on the leg by cod-liver oil, and quinine and iron, without washing and dressing the sore place itself.

TWO AMPUTATIONS, TREATED UPON M. MAISONNEUVE'S METHOD OF PNEUMATIC ASPIRATION,

WITH REMARKS,

By ROBERT HAMILTON, F.R.C.S.,

SURGEON TO THE SOUTHERN HOSPITAL.

M. Maisonneuve has announced to the British medical world, in the first number of the new monthly magazine, *The Practitioner*, his method of treating amputations by pneumatic aspiration; and, as he there speaks of it as sanguinely as when he described it to the Academy of Science more than a year ago, it is a proof that the frequent opportunities he has had of testing its value in the wards of the Hotel Dieu, during the interval, have only confirmed his first belief in its success.

The mortality after amputations in this country does not bear the same high ratio to recoveries that it does in the Paris hospitals, nor can it be allowed of that mortality that ninety-five per cent., as stated by M. Maisonneuve, in his *Mémoire sur les Intoxications Chirurgicales*, is due to poisoning of the system through the wound. In primary amputations it is often the amount of shock the system received at the time of the accident, or of other injuries received at the same time, which lead to the fatal result after the operation.

In secondary amputations, in many cases, the condition of the patient is such, prior to the operation, through exhausting discharges, or the presence of disease in other organs, that the faint hope of saving the life through removal of the limb is not realised. Making, therefore, a larger deduction than five per cent., probably thirty per cent., for these and other causes of mortality

after amputation, there still remains a great proportion, seventy per cent. of deaths, which may be allowed to be due to the active agency of a noxious organic life, present in the atmosphere surrounding the patient, which finds a ready entrance into his system by its action upon an open suppurating surface.

We are therefore in a position to welcome with gladness any plan offering a prospect of preventing this great cause of mortality, which, during the seasons when pyæmia, erysipelas, or gangrene are prevalent in the wards of a hospital, plays sad havoc among the amputations, many a life being cut short on these occasions which in private practice would have been saved.

The apparatus for carrying out the principle of exclusion of air from an amputated stump has been described by its author in the journal alluded to.* It will suffice now if, in the history of the two cases in which I used it, I explain the mode of its application. By the aid of the illustrations it will be fully understood. The first case was an amputation of the leg.

E. G., æt. 36, servant, unmarried; disease of right os calcis, four years' duration. About twelve months previous to the present operation, a large portion of the os calcis was sawn off; the wound healed but slowly.

It was not till Christmas, 1867, she was discharged from the hospital. She was again admitted in March of the present year, with the foot and ankle much inflamed, having a sinus leading from the old wound to necrosed bone. The os calcis seemed altogether unsound. Various considerations, connected with her general state of health, decided me to amputate the leg. The operation was performed April 8th, at two o'clock, under chloroform. An antero-posterior flap was made, the latter being somewhat the longer. One artery only was tied. Torsion was sufficient to check hæmorrhage from five others. The wound was sponged well with carbolic lotion. The flaps brought together by four sutures. No strapping used. A few pieces of lint, soaked in

* The instrument used is precisely similar to that made by Charriere for M. Maisonneuve, and was procured from Mr. Salt, of Birmingham, who made it from the pattern brought over by Mr. Gamgee and used by him in 1867.

carbolic oil, were put round the stump. The patient was then removed to bed, and the pneumatic apparatus fixed. First, the india-rubber bag, or hood, was drawn over the stump, without removing the lint; its free border reached nearly to the knee; then both it and the receiver with which it was connected were exhausted of air by means of the air-pump.

No. 1.

The sketch shows the appearance of the limb, and position of the receiver, after all the steps in the process are complete. The hood (*a*) closely grasps the limb, the air-pump (*b*) has been worked, exhausting the air from the receiver (*c*), and of necessity drawing all the air intervening between the stump and hood along the tube (*d*) into the receiver. The compression exercised by the hood on the stump was an evidence that the air was exhausted.

The arranging of the apparatus gave little or no pain to the patient, not even when being exhausted of air; the only painful part is the drawing on of the hood, as the latter is made to be close fitting, it is drawn on with some difficulty, even though elastic. The tube (*d*), after the tap (*e*) is closed, can be withdrawn from the glass receiver, and the latter with brass pump removed, and kept in readiness near. It is more convenient, however, to keep them *in situ*, and not to have to fix on the tube every time the air-pump has to be worked. By withdrawing the cork through which both tubes enter the bottle, the latter can be removed and emptied.

Previous to the operation, the patient's pulse was 84, respiration 30, temperature 96°.

11 p.m. — Vomited once since the operation, complains of excessive faintness. The tap turned, and the syringe worked two or three times, to tighten the grasp of hood, which had relaxed somewhat.

9th, 7.30 a.m. — Had slept at intervals during the night, no vomiting. Pump again worked. Pulse 80, respiration 26, temperature 101$\frac{2}{5}$°.

9 p.m. — Has vomited once to-day. Feels very sleepy, but leg starts, and prevents sleep. Can take little nourishment beyond a drink of iced milk, a feeling of excessive nausea prevents her. Pump worked, and this time two to three ounces of bloody fluid passed into the receiver. The stump through the hood feels very hot, its temperature is much greater than that of the skin in the axilla, whilst the leg just above the hood has a lesser temperature than the axilla. Lint dipped in an evaporating lotion to be applied on hood, and directions given to change it frequently. Pulse 96, respiration 34, temperature 101°.

10th. — Has passed restless night, through pain and starting of limb. No actual vomiting, but feeling of nausea continues. Temperature 99$\frac{2}{5}$°, pulse 76, respiration 32.

10 p.m. — Pulse 86. The pump worked night and morning, the fluid has increased in quantity, and more purulent. The receiver is detached each time, and emptied, washed, and replaced at once.

11th. — Pulse 96, temperature 98$\frac{2}{5}$°, respiration 34. Up to this time the colour and general appearance of limb immediately above the hood was quite natural, no swelling, redness, or tension, but to-day a blush of redness was observed on the outside of leg, extending to the knee. She had slight rigors during the night. The discharge drawn into receiver smelt very offensive.

12th. — The pulse continues to rise, being to-day 118, temperature 104°. The erysipelatous blush has increased considerably, and she complains of a good deal of pain in the leg. I therefore determined to remove the hood. On doing so, the lint which enveloped the hood came off with it; the lint was saturated

with pus, which smelt abominably. Appearance of stump: the edges of the flaps were inflamed and pouting, except where held together, and deeply grooved by the sutures, two of the latter had ulcerated through, and the skin and subjacent tissue had sloughed to the extent of a shilling. The sutures were removed, care being taken not to allow the flaps to fall apart, which they probably would have done if unsupported. The redness which had been observed above the hood was an isolated patch, about the size of the hand, not extending down to the edge of flap. The stump was well washed with carbolic lotion, dried, and the hood, after being thoroughly cleansed, was re-applied.

13th.—Had a good deal of pain in leg all yesterday, but slept well last night. The redness, as much of it as can be seen above the hood, is considerably diminished. Pulse 96°, temperature 98⅗°, respiration 30.

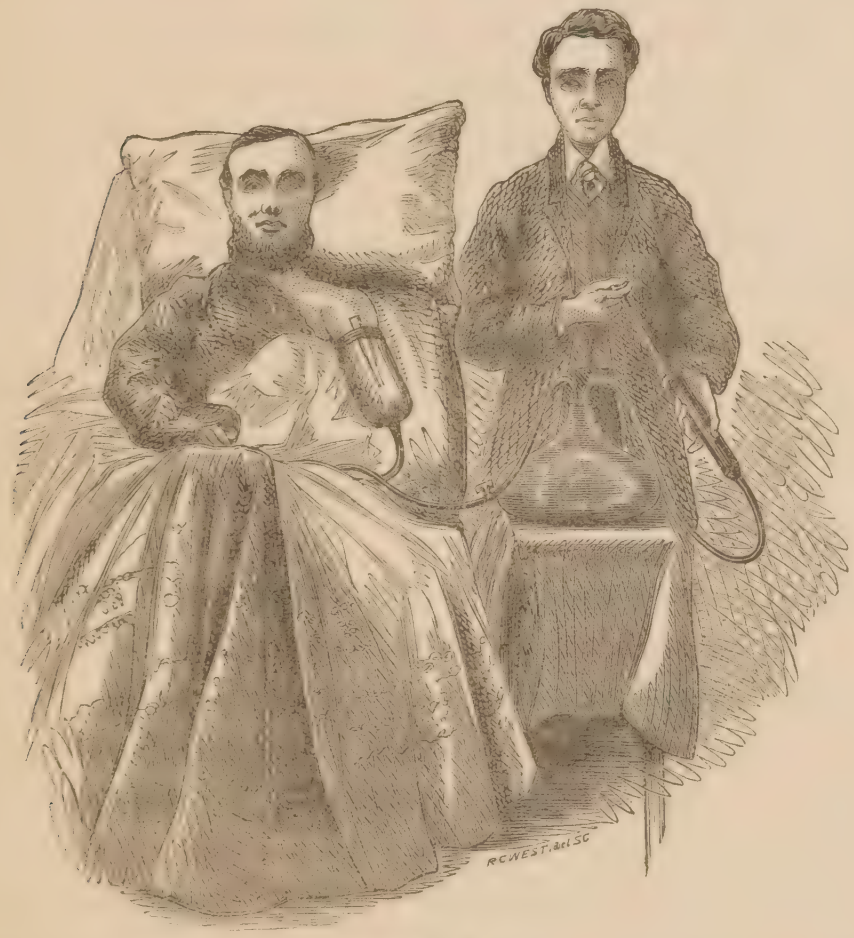
14th.—Much the same, the quantity of purulent matter drawn off daily varies from four to six ounces.

15th.—The hood was again removed, in consequence of consiiderable enlargement of one of the inguinal glands. A line of tenderness could be traced up from the stump to it. The skin about the gland was inflamed, and excessively tender. She had again had rigors during the night. The stump was pale, the redness had disappeared, there was no bagging, the flaps were uniting, and a fair amount of pus bathed their surfaces. Considering that the threatened suppuration of the inguinal gland was due to the confinement and compression unavoidable to the use of the India-rubber hood, the natural action of the skin being by it interfered with, and the process going on in the granulating surface of flaps disturbed, if not positively reversed action set up, which might lead to purulent absorption or phlebitis, I discontinued the use of the apparatus. The stump, after being well washed, was dressed with two strips of plaster, lint soaked in carbolic oil, and a short bandage to keep on the latter. This dressing was daily renewed. The gland in the groin suppurated, forming a large abscess, and for a few days causing great constitutional disturbance; it was opened on the 26th of April. After this the recovery was rapid, the stump was quite healed in a month from the operation.

The next case was an amputation of the arm.

Charles M'Ardle, aged 27, shipwright.—Admitted into Southern Hospital July 7th, 1868. Disease of left elbow and wrist joints, existing five years. Commenced in hand, which was crushed, and the metacarpal bones of first and second finger fractured; strumous growth appeared, three or four months after the accident, emerging from the wound; the wrist-joint then became thickened, enlarged, and diseased, and about two years ago the elbow-joint became implicated. The whole limb now is wasted to half the dimensions of the other, except over the affected joints, where it is abnormally enlarged. Strumous constitution, mother died of phthisis.

July 15th.—Having improved in appetite, and being in better



No. 2.

The drawing shows an assistant exhausting the air from the glass receiver, after the patient has been removed to bed, and the tube proceeding from the hood fitted into the cork of the bottle The pumping out of the air is causing the hood to grasp very closely the stump, and, when the latter is sufficiently compressed, the tap on the tube is closed, and the pump laid by the side of the bottle.

condition than when admitted, I amputated the arm about two inches above the elbow, the patient being under chloroform; double flaps, two ligatures only applied, hœmorrhage from other arteries checked by use of torsion forceps. No sutures used, but after washing cut surfaces and whole of the limb with carbolic lotion (1 to 40), and well drying it, three strips of plaster brought the flaps into apposition, and then the stump was enclosed in the hood of pneumatic apparatus without any lint or bandage intervening.

9 p.m.—Quite comfortable; had not slept, but felt easy. Pulse 84. No sickness. A jar, filled with cold water, was suspended close to the limb for the purpose of keeping the india-rubber bag cool by irrigation.

16th, 11 a.m.—Passed a comfortable night. Pulse 80. Skin moist. No swelling of arm above the bag. Irrigation continued. The pump was used about every eight hours, drawing into receiver on each occasion, after the first time, three to four ounces of sanguineous fluid.

17th, Friday, 11 a.m.—Pulse 90. Vomited once this morning, shortly after taking some bread and milk. Feels the great heat of weather a good deal. Perspires very freely. Heat of skin, somewhat more. No inclination for food of any kind. Appearance of arm, above hood, pale and healthy; no swelling or tenderness. The end of stump feels, through the bag, expanded, and of much greater circumference than the arm above. This only applies to the immediate extremity, for the rest of the arm enclosed in the bag feels soft, and of the same dimension as that above the margin of the hood. 8 p.m.—Pulse 102.

18th, 11 a.m.—At eleven o'clock, last night, he woke up from a short sleep in a great fright, the arm gave a violent jerk, in a few minutes he vomited some arrow-root he had shortly before taken. Then he became very cold, inwardly cold, and shook very much. The rest of the night uneasy, and no sleep. Pulse is now 120. He vomits shortly after taking anything. Heat of skin much increased. The appearance of arm, above hood, unchanged; no swelling, or redness, or tenderness. The fluid drawn off into receiver more purulent, not offensive in smell, and the quantity about five ounces.

9 p.m.—Felt very poorly all day. Nothing will stay on his stomach. Tongue much furred. Pulse 126. No change in appearance of stump. Four ounces of purulent fluid drawn off. Feeling satisfied that the unfavourable symptoms now present must be attributable to the hood, and taking into consideration the man's enfeebled condition previous to the operation, and the state of his lungs, in which tubercular deposit, it was even then feared, had begun, I did not deem it advisable to risk further delay with the hope of an improvement in the symptoms, but determined to remove the hood. Upon doing so, the appearance of the stump was found to be most satisfactory, and very different from that presented in the last case, when uncovered for the first time. Skin, pale and soft, not the slightest inflammation; flaps adherent, and, where not covered by plaster, considerable bulging of tissue, so as to overlap the edges of the plaster; still these projecting portions of the two flaps were adherent by their adjacent surfaces, as much so as the parts held in apposition under the plaster. Under the latter the granulating surface did not project beyond the level of the skin. There was no bagging. The circumference of limb was not greater in any part beneath the hood than above it, except at the immediate extremity, which had expanded into a club-stick form, from the pressure of the hood being less there than elsewhere.

The limb was washed with carbolic lotion, fresh strips of plaster applied, and lint soaked with carbolic oil. Over all, two or three turns of a bandage. The pneumatic apparatus was not re-applied.

19th, 11 a.m.—Pulse gone down to 108. No vomiting all night, but felt much more comfortable. Slept a good deal. Inclined to take food. Stump again dressed.

20th.—Pulse 104. Stump again dressed; no swelling; no separation of flaps. Slept well all night. No sickness all yesterday. Appetite greatly improved.

21st.—Good night; slept well. No sickness. Pulse 86. Wound contracting rapidly.

22nd.—The progress from this time was rapid. He was allowed to get up and walk about the ward to-day.

August 22nd.—The stump was completely healed. Sent him to Southport for three weeks.

It may seem premature, on the observation of two cases only, to draw unfavourable conclusions as to the value of a new method of treatment, but, without condemning M. Maisonneuve's plan, believing that its modified use may be found of great advantage under certain circumstances, I would point out the objections which its adoption made patent in the cases related.

Firstly.—The uniform compression of a stump has the disadvantage of producing at the point where the pressure ceases, be it six or eight inches up the limb, an engorgement of the capillaries and other vessels, whilst restricted action necessarily follows throughout the compressed portion.

Secondly.—The amount of suction exercised upon the cut tissues, every time the air is exhausted causes an excessive exudation, which is seen in the amount of fluid drawn off, after the first twenty-four hours into the receiver, the quantity varying from two to six ounces, a quantity much greater than is secreted in the same space of time, under the ordinary method of treating amputations. Much of this fluid is charged with reparative material, which is thus abstracted, instead of being used up. What a waste of material, and consequently of power is here.

Thirdly.—An air-tight India-rubber bag interferes with the normal action of the skin, there is no evaporation, and the hood becomes very hot. This suspension of the principal function of the skin in the immediate vicinity of the lesion, must tell injuriously on the latter, though one of its results, the great heat of the hood and limb, can be obviated, and was so in the cases related by the use of an evaporing lotion in the one, and of irrigation in the other. The checking of the very important functions of the skin, absorption and secretion, has, however, deeper effects than this.

Fourthly.—When the suction induced by the pumping ceases, re-action takes place, for with the most closely fitting bag, exhaustion or suction is not constantly going on, but ceases shortly after the pumping is discontinued; and then, probably at the

junction of the constricted with the unconstricted portion of the limb, absorption sets in, an absorption varying in intensity according to the amount of constriction existing below, but continuing until the next pumping takes place. For the first day or two it may be only harmless blastema, some of which is thus forced into a retrograde course; but from the third day, when cells possessing varying degrees of power, to use Dr. Beale's expression, are evolved, for the production of the different tissues; and when many of the cells lose formative power, and become degraded, though not inactive; then these degraded cells, which we call pus corpuscules, are apt to be drawn into the circulation, and give rise to local or remote mischief.

This is what happened in Mr. Gamgee's unfortunate case, which he has so graphically described in the 2nd volume of the *Lancet* for 1867, at pp. 484 and 670. In this instance, it was an amputation of the thigh, and probably the first case in this country in which the pneumatic apparatus was tried. The patient died on the forty-fifth day after the operation, but the unfavourable symptoms set in on the sixth day. The autopsy revealed the femoral vein filled with pus, and considerable collections of matter under the deep fascia, between the muscles and under the femoral vessels, at the middle of the thigh. The stump was quite healed, and the viscera healthy.

In the first of the two cases I have related, there occurred an absorption of pus corpuscules on the third day by the superficial layer of lymphatics, which produced a blush of redness, and inflammation at the spot where the further progress was arrested, the cellular tissue immediately below the skin, in the neighbourhood of the knee-joint. This was checked by the removal of the hood, and probably the suppuration induced found an exit in the stump, to which it was so near. Again the suppuration in the inguinal glands commencing on the sixth day, forty-eight hours after the hood had been re-applied, was due to pus carried up by the absorbents, either directly from the compressed flaps, or from the inflamed part already mentioned, a portion of which was under pressure.

In the amputation of the arm, the same cause was leading to

more serious results, for, instead of taking the form of superficial abscesses, a more alarming train of consequences threatened, if the pressure had not been removed. That persistent vomiting is an evidence of reversed action, and one of its earliest indications, my own observation, and that no doubt of others, has proved. There was therefore good reason to fear from the symptoms that the absorbents in the vicinity of the constricted limb had begun to convey into the system degraded corpuscules, and that the next step in the process would have been the formation of abscesses for their elimination, in some part or organ in which their further progress had been checked. How rapidly the symptoms disappeared, as soon as the hood was removed, the history of the case shews.

It will be observed that the very mischief produced in Mr. Gamgee's case and in mine, and attributed to the pneumatic apparatus, seems, at first sight, to be that for which we should expect M. Maisonneuve's invention to be a preventative—phlebitis, and the formation of abscesses. But it is quite sufficient to give rise to either of these, if we force into the circulation the degraded pus corpuscule, without requiring a septic germ to come in contact with it, and give it its own specific form of disease.

M. Maisonneuve lays great stress on being able to remove by his apparatus "all dead liquids" from the surface of wounds. This I maintain it is impossible to do *in toto;* still it can be done to a much greater extent by leaving no intervening substance between the hood and stump, except the strips of plaster, than if we put layers of lint and bandage as described in his paper, only to get them soaked with discharge, which no amount of suction can entirely remove.

In Mr. Gamgee's case, when the hood was removed, a slight red mark round the limb shewed the line of constriction produced by its margin. In neither of my cases was there any mark, or the slightest difference in the appearance of the skin, either above or beneath the hood. Whether such would have occurred if the latter had remained the same length of time, it is impossible to say. I think not; the hood was larger than Mr. Gamgee's, and the pressure exercised was equable, and no greater at the margin than at any other part enclosed within it, except the very end.

Having thus pointed out the principal objections to M. Maisonneuve's treatment of amputations by pneumatic aspiration, some of which must be unavoidable from the very principle on which the instrument is constructed, I still think there are circumstances in hospital practice under which it can be useful, and ought to be adopted. The following precautions suggest themselves. The hood should be removed at the end of fifty-six hours, by which time, as a rule, the adhesions between the adjacent surfaces ought to be tolerably firm. No other dressing should intervene between the stump and hood than the few strips of plaster. The stump must be carefully cleansed with some antiseptic lotion every time the hood is removed, and exposed as short a time as possible. The hood had better be removed, after the first dressing, every twenty-four hours. The pump should be worked only once in twelve hours, and then not too vigorously. The hood should not be re-applied if persistent vomiting, rigors, or perspirations have set in. Some antiseptic powder should be put in the receiver.

As there are conditions, but little understood as yet, which give rise to the presence of septic germs in the atmosphere of an hospital, and that these do produce, through the medium of a suppurating surface, certain diseases, such as pyæmia, gangrene, and erysipelas, each of which requires its own special germ to produce it, it seems incumbent on us, when they are prevailing in our wards, and we have an amputation to perform, to adopt all means to prevent our patient becoming their victim. M. Maisonneuve's plan, when combined with the use of carbolic acid, offers the best protection against the entrance of noxious germs into a stump, and deserves the fullest trial at our hands.

THE THERAPEUTIC VALUE OF BELLADONNA IN REFERENCE TO DISEASES OF THE BLADDER AND URETHRA,

By REGINALD HARRISON, F.R.C.S.,

ASSISTANT SURGEON TO THE ROYAL INFIRMARY, AND LECTURER ON ANATOMY AT THE SCHOOL OF MEDICINE.

I propose briefly to allude to some advantages I have observed to follow the use of belladonna, local and general, in certain disorders of the genito-urinary system.

As a topical application, I have used it with benefit in some of the more obstinate forms of stricture, especially those consequent on injuries of the urethra.

Referring back, we find some of the surgeons of the last century strongly recommending it, where spasm was present, to produce relaxation; but as we are now provided with remedies more certain in their action for combating this complication, this drug has naturally fallen into disuse.

It is not, however, in reference to any antispasmodic influence it may possess, that I purpose to allude, but to the power which I believe it has of directly influencing and effecting a change in the obstructing material. I was first induced to give it a trial in these cases by observing the benefit that followed its application to cicatrices, and growths of a fibrous character resembling them; in one instance especially, an unsightly deformity on a young woman's forehead, the constant application of the extract of belladonna produced a very decided effect; the cicatrice, though not disappearing, became much softer, more like the healthy skin around it, but what was of still more importance, it lost almost entirely the tendency to contraction which is so

productive of such painful deformities. I have used it with undoubted advantage in other cases, and I therefore had reason for anticipating an equal benefit from its application to such internal cicatrices as gave rise to inconvenience. Of these, the most distressing and obstinate is the stricture following injury to the urethra. It may be dilated, very often, readily, but soon returns, unless constantly under supervision. Dilatation simply *stretches* the cicatrix, without in any way depriving it of that contractile power which is the essence of the disorder.

Some patients may be instructed how to introduce an instrument for themselves, but such a course, for obvious reasons, is not of universal application. Others may be permanently relieved by proceedings of a more strictly operative character, and with comparatively little danger, but from these we find they sometimes shrink. It is to meet such cases that I would suggest the use of belladonna.

The most convenient way of applying it is with the Oleum Theobromæ of the Pharmacopeia, which is sufficiently hard at ordinary temperatures to permit of its ready introduction into the urethra. I generally recommend two grains of the extract of belladonna to be used in this way twice a day, in conjunction with the regular introduction of the metallic bougie in gradually increasing sizes; the belladonna should be persevered in for some time after the bougies have been discontinued.

Very great and, I believe, permanent benefit has resulted from this plan of proceeding, and in cases where the bougie treatment *alone* had previously only effected but very temporary relief. I may also add that my observation is confirmed by others, who have given this plan a trial.

Administered internally, belladonna is one of the most valuable anodynes we possess, and it appears to me to be specially applicable to disorders of the urinary system. In reference to its alkaloid atropine, Dr. Anstie remarks, in the first number of the *Practitioner*, "that it is incomparably the best of all medicinal remedies for every kind of pain in the pelvic viscera. Nothing can approach it in this respect."

The rapidity with which the alkaloid atropia is eliminated from the system is very remarkable. Dr. John Harley, in his Gulstonian Lectures, mentions that he had "repeatedly demonstrated the presence of atropia in the urines of different individuals, eighteen, nineteen and twenty minutes after the subcutaneous injection of the forty-eighth and even the ninety-sixth of a grain of sulphate of atropia."

In addition to the general narcotic effects exercised by the drug, the actual presence of the alkaloid in the urine may further explain the benefit following its administration in urinary affections.

The inconveniences attending the use of belladonna are slight, compared with those of opium and other narcotics; the appetite is not interfered with, and, beyond sometimes a little temporary dimness of vision, no cerebral unpleasantness is experienced.

The cases in which the remedy is generally applicable are those which may be classified under the generic term of "irritable bladder." Its use may be advantageously continued, in conjunction with other expedients, for the removal of any exciting causes that may be present, such as the dilatation of strictures, removal of calculi, and other sources of irritation.

There is a form of irritation not infrequently observed, both in males and females, more especially the latter, where there is great irritability, accompanied with the deposition in the urine of large quantities of epithelium. The symptoms sometimes resemble those of calculous disorders, but on introducing a sound, a roughened condition of the lining membrane is alone detected. These almost invariably do well under the influence of belladonna. The nocturnal incontinence observed in delicate children, in nearly all cases the results of a simply irritable bladder and nervous system, do well with small doses of atropine combined with general hygienic measures.

In reference to the mode of administration, I have little to add. I generally prescribe the extract of belladonna in grain doses, once or twice a day, in the form of pills; or the solution of atropine, $\frac{1}{80}$ of a grain to $\frac{1}{60}$, very gradually increased, until

a slight degree of atropism — dryness of the throat, or dimness of vision — is produced. Beyond this it is undesirable to go. Dr. Anstie, whom I have already quoted, speaks very highly of the hypodermic administration of atropine, in the first number of the *Practitioner*. He, at the same time, very properly points out the caution with which the remedy, in this form, should at all times be used.

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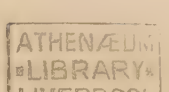

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